

5-11-1
67

CRPL-F 255 PART A

FOR OFFICIAL DISTRIBUTION

National Bureau of Standards
Library, 400 24th St
DEC 17 1965

Reference book not to be
taken from the library.

PART A
IONOSPHERIC DATA

ISSUED
NOVEMBER 1965

NOTICE

See announcement on page ii

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
INSTITUTE FOR TELECOMMUNICATION SCIENCES AND AERONOMY
(FORMERLY CENTRAL RADIO PROPAGATION LABORATORY)
BOULDER, COLORADO

ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
INSTITUTE FOR TELECOMMUNICATION SCIENCES AND AERONOMY
(FORMERLY CENTRAL RADIO PROPAGATION LABORATORY)
BOULDER, COLORADO

IONOSPHERIC DATA

CONTENTS

	Page
Ionospheric Data	ii
Table of Smoothed Observed Zurich Sunspot Numbers	iii
World-Wide Sources of Ionospheric Data	iv
Tables and Graphs of Ionospheric Data	1
Index of Tables and Graphs of Ionospheric Data in CRPL-F 255 (Part A)	51

THE IONOSPHERIC DATA PRESENTED IN THE 100 TABLES AND GRAPHS OF THIS ISSUE WERE ASSEMBLED BY THE INSTITUTE FOR TELECOMMUNICATION SCIENCES AND AERONOMY FOR ANALYSIS, CORRELATION, AND DISTRIBUTION. THE FOLLOWING ARE THE SOURCES OF DATA.

REPUBLICA ARGENTINA, MINISTERIO DE MARINA
BUENOS AIRES, ARGENTINA
TRELEW, ARGENTINA
TUCUMAN, ARGENTINA

COMMONWEALTH OF AUSTRALIA, IONOSPHERIC PREDICTION SERVICE OF
THE COMMONWEALTH OBSERVATORY
BRISBANE, AUSTRALIA
CANBERRA, AUSTRALIA
COCOS IS.
HOBART, TASMANIA
MAWSON, ANTARCTICA
NORFOLK I.
TOWNSVILLE, AUSTRALIA
VANIMO
WILKES STATION, ANTARCTICA

AUSTRALIAN DEFENCE SCIENTIFIC SERVICE
WEAPONS RESEARCH ESTABLISHMENT, DEPARTMENT OF SUPPLY
SALISBURY, SOUTH AUSTRALIA
WOOMERA, AUSTRALIA

AUSTRALIAN DEPARTMENT OF NATIONAL DEVELOPMENT, BUREAU OF
MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS
MUNDARING, WESTERN AUSTRALIA
PORT MORESBY, PAPUA

BELGIAN ROYAL METEOROLOGICAL INSTITUTE
DOURBES, BELGIUM

UNIVERSIDAD MAYOR DE SAN ANDRES
LA PAZ, BOLIVIA

ELECTRONICS DIRECTORATE OF THE BRAZILIAN NAVY
NATAL, BRAZIL

BRITISH DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH,
RADIO RESEARCH BOARD
ARGENTINE IS.
HALLEY BAY, ANTARCTICA
IBADAN, NIGERIA (UNIVERSITY COLLEGE OF IBADAN)
INVERNESS, SCOTLAND
PORT LOCKROY, ANTARCTICA
PORT STANLEY (FALKLAND IS.)
SINGAPORE, MALAYSIA
SLOUGH, ENGLAND

CENTRAL INSTITUTE OF METEOROLOGY, BUDAPEST, HUNGARY
BEKESCSABA, HUNGARY

DEPARTMENT OF TRANSPORT, TELECOMMUNICATIONS AND
ELECTRONIC BRANCH, CANADA
CHURCHILL, CANADA
KENORA, CANADA
OTTAWA, CANADA
RESOLUTE BAY, CANADA
ST. JOHNS, NEWFOUNDLAND

UNIVERSIDAD DE CONCEPCION
CONCEPCION, CHILE

RADIO WAVE RESEARCH LABORATORIES, DIRECTORATE GENERAL OF
TELECOMMUNICATIONS, MINISTRY OF COMMUNICATIONS,
TAIPEI, HSIAN, TAIWAN, REPUBLIC OF CHINA
TAIPEI (TAIWAN), CHINA

INSTITUTO GEOFISICO DE LOS ANDES COLOMBIANOS
BOGOTA, COLOMBIA
LWIRO, CONGO

V

CENTRAL AFRICAN INSTITUTE FOR SCIENTIFIC RESEARCH
METEROLOGICAL SERVICE OF CONGO
LEOPOLDVILLE, CONGO

CZECHOSLOVAK ACADEMY OF SCIENCES
PRUHONICE, CZECHOSLOVAKIA

DANISH NATIONAL COMMITTEE OF URSI
GODHAVN, GREENLAND
NARSSARSSUAQ, GREENLAND

GENERAL DIRECTION OF POSTS AND TELEGRAPHS, HELSINKI, FINLAND
NURMIJARVI, FINLAND

THE FINNISH ACADEMY OF SCIENCES AND LETTERS
SODANKYLA, FINLAND

IONOSPHERIC RESEARCH GROUP (GRI), FRANCE
GARCHY, FRANCE
TAMANRASSET, ALGERIA

IONOSPHERIC PREDICTIONS DIVISION OF C.N.E.T. (DPI), FRANCE
DAKAR, SENEGAL
DJIBOUTI, FRENCH SOMALILAND
PARIS, FRANCE
POITIERS, FRANCE
TAHITI, SOCIETY IS.
TANANARIVE, MALAGASY REPUBLIC

HEINRICH HERTZ INSTITUTE, GERMAN ACADEMY OF SCIENCES
JULIUSRUH/RUGEN, GERMANY

INSTITUTE FOR IONOSPHERIC RESEARCH, LINDAU UBER NORTHEIM
LINDAU/HARZ, GERMANY

IONOSPHERE INSTITUTE, NATIONAL OBSERVATORY OF ATHENS
ATHENS (SCARAMANGA), GREECE

INDIAN COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH,
RADIO RESEARCH COMMITTEE, NEW DELHI, INDIA
AHMEDABAD, INDIA (PHYSICAL RESEARCH LABORATORY)
BOMBAY, INDIA (ALL INDIA RADIO)
DELHI, INDIA (ALL INDIA RADIO)
HARINGHATA, INDIA (INSTITUTE OF RADIO PHYSICS AND ELECTRONICS)
HYDERABAD, INDIA (DEFENCE ELECTRONICS RESEARCH LABORATORY)
KODAIKANAL, INDIA (INDIA METEOROLOGICAL DEPARTMENT)
MADRAS, INDIA (ALL INDIA RADIO)
TIRUCHY, INDIA (ALL INDIA RADIO)
TRIVANDRUM, INDIA (ALL INDIA RADIO)

IONOSPHERIC OBSERVATORY, INSTITUTE OF GEOPHYSICS
TEHRAN, IRAN

GEOPHYSICAL AND GEODETIC INSTITUTE, GENOVA, ITALY
GENOVA (MONTE CAPELLINO), ITALY

NATIONAL INSTITUTE OF GEOPHYSICS, CITY UNIVERSITY, ROME, ITALY
ROME, ITALY

MINISTRY OF POSTS AND TELECOMMUNICATIONS, RADIO RESEARCH
LABORATORIES, TOKYO, JAPAN
AKITA, JAPAN
KOKUBUNJI, TOKYO, JAPAN
WAKKANAI, JAPAN
YAMAGAWA, JAPAN

GENERAL DIRECTORATE OF TELECOMMUNICATIONS, MEXICO
EL CERILLO, MEXICO

THE ROYAL NETHERLANDS METEOROLOGICAL INSTITUTE
DE BILT, NETHERLANDS
PARAMARIBO, SURINAM

CHRISTCHURCH GEOPHYSICAL OBSERVATORY, NEW ZEALAND DEPARTMENT
OF SCIENTIFIC AND INDUSTRIAL RESEARCH
CAMPBELL I.
CAPE HALLETT (ADARE), ANTARCTICA
GODLEY HEAD (CHRISTCHURCH), N. Z.
RAROTONGA, COOK IS.
SCOTT BASE, ANTARCTICA

NORWEGIAN DEFENCE RESEARCH ESTABLISHMENT, KJELLER PER
LILLESTROM, NORWAY
TROMSO, NORWAY

MANILA OBSERVATORY, PHILIPPINES
MANILA, LUZON

INSTITUTE OF TELECOMMUNICATION, WARSAW, POLAND
WARSAW (MIEDZESZYN), POLAND

EBRO OBSERVATORY
TORTOSA, SPAIN

RESEARCH INSTITUTE OF NATIONAL DEFENCE, STOCKHOLM, SWEDEN
KIRUNA, SWEDEN
LYCKSELE, SWEDEN
UPPSALA, SWEDEN

ROYAL BOARD OF SWEDISH TELEGRAPHS, RADIO DEPARTMENT
LULEA, SWEDEN

POST, TELEPHONE AND TELEGRAPH ADMINISTRATION
SOTTENS, SWITZERLAND

RHODES UNIVERSITY, REPUBLIC OF SOUTH AFRICA
SANAE BASE, ANTARCTICA

SOUTH AFRICAN COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH
CAPETOWN, UNION OF SOUTH AFRICA
JOHANNESBURG, UNION OF SOUTH AFRICA

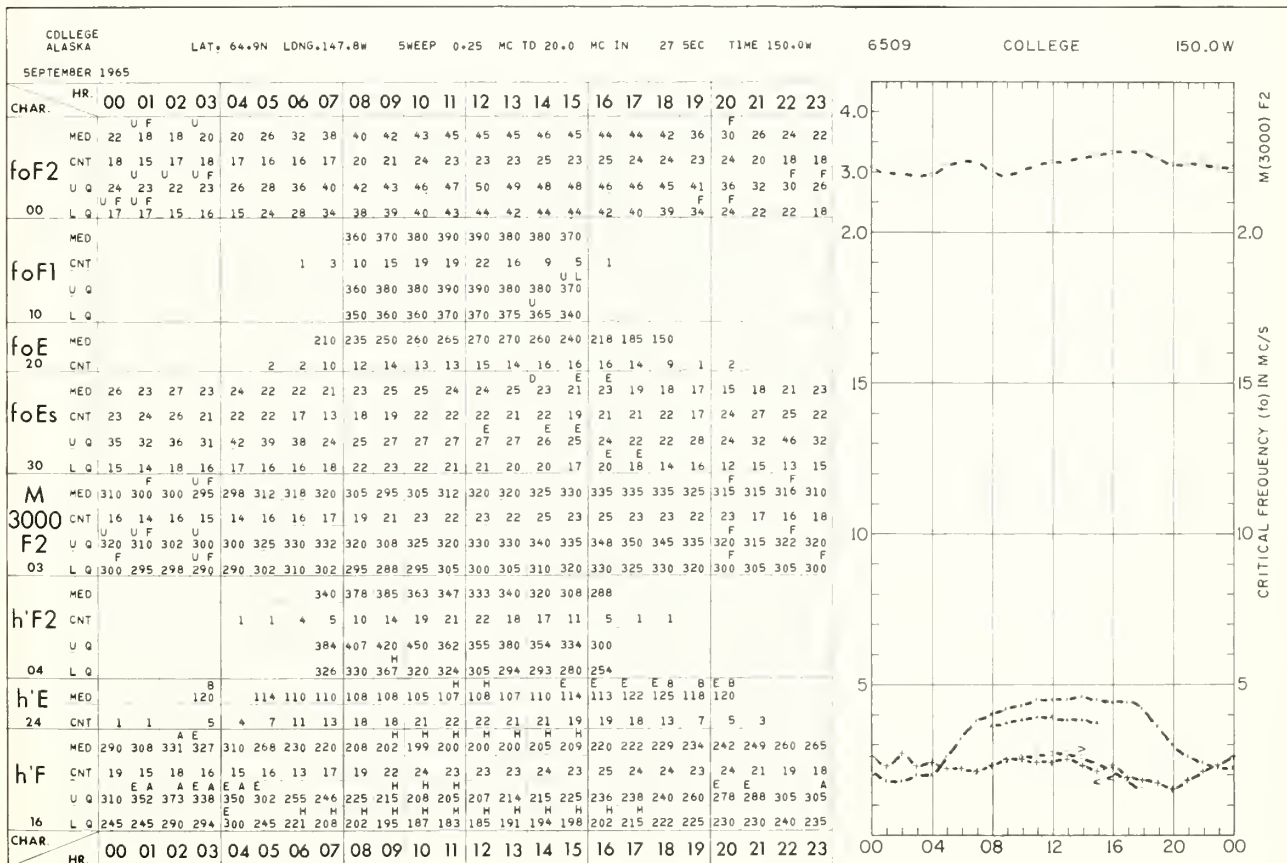
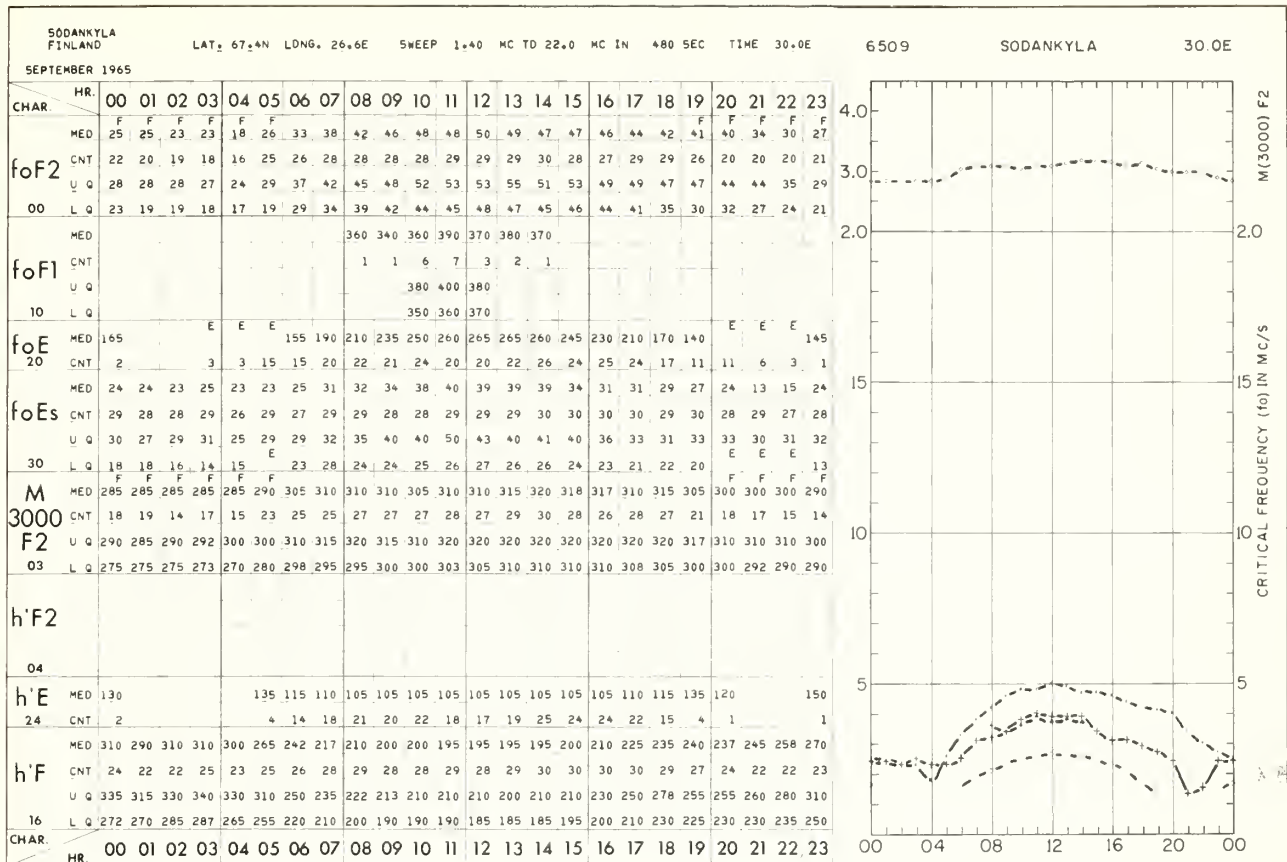
UNITED STATES ARMY RADIO PROPAGATION AGENCY,
UNITED STATES OF AMERICA
ADAK, ALASKA
BANGKOK, THAILAND
FT. MONMOUTH, NEW JERSEY
GRAND BAHAMA I.
OKINAWA I.
THULE, GREENLAND
WHITE SANDS, NEW MEXICO

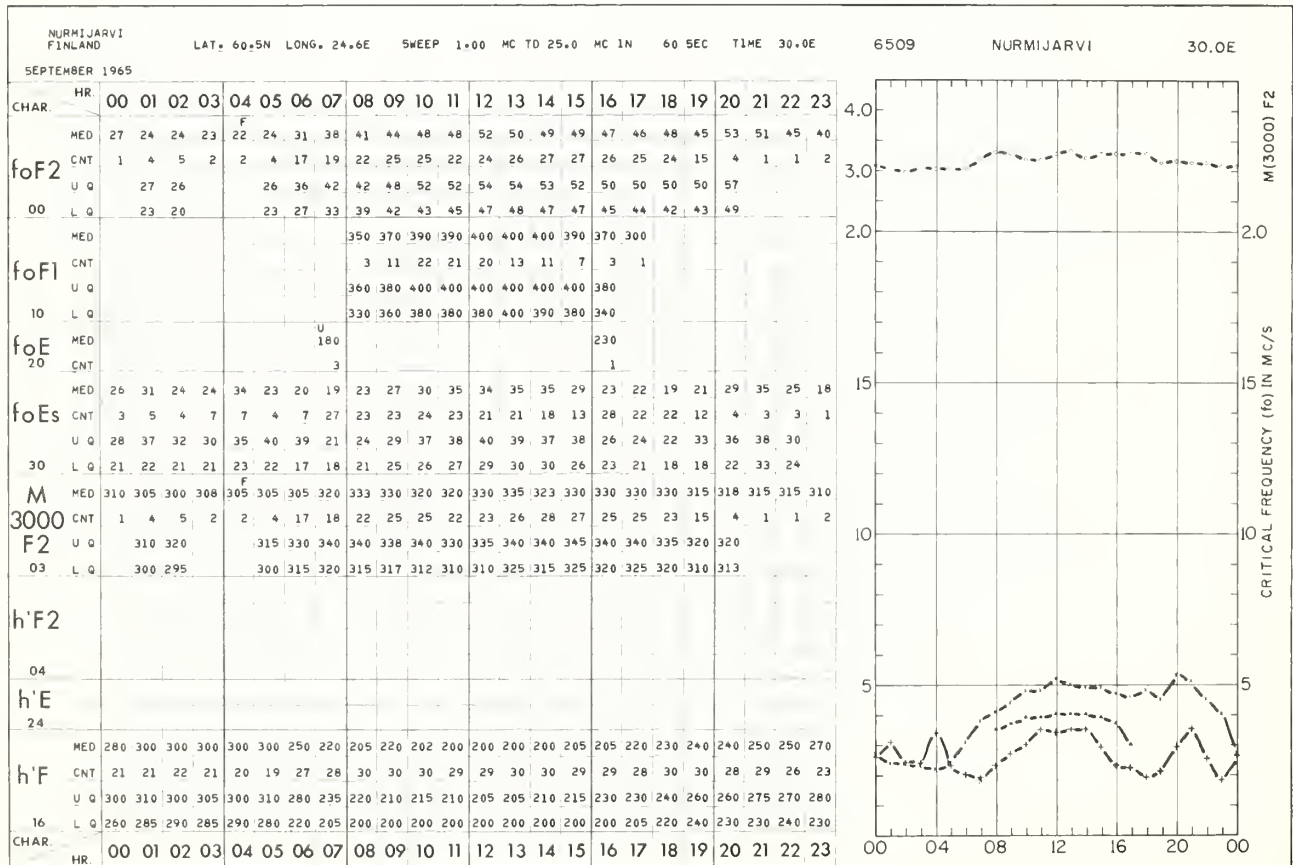
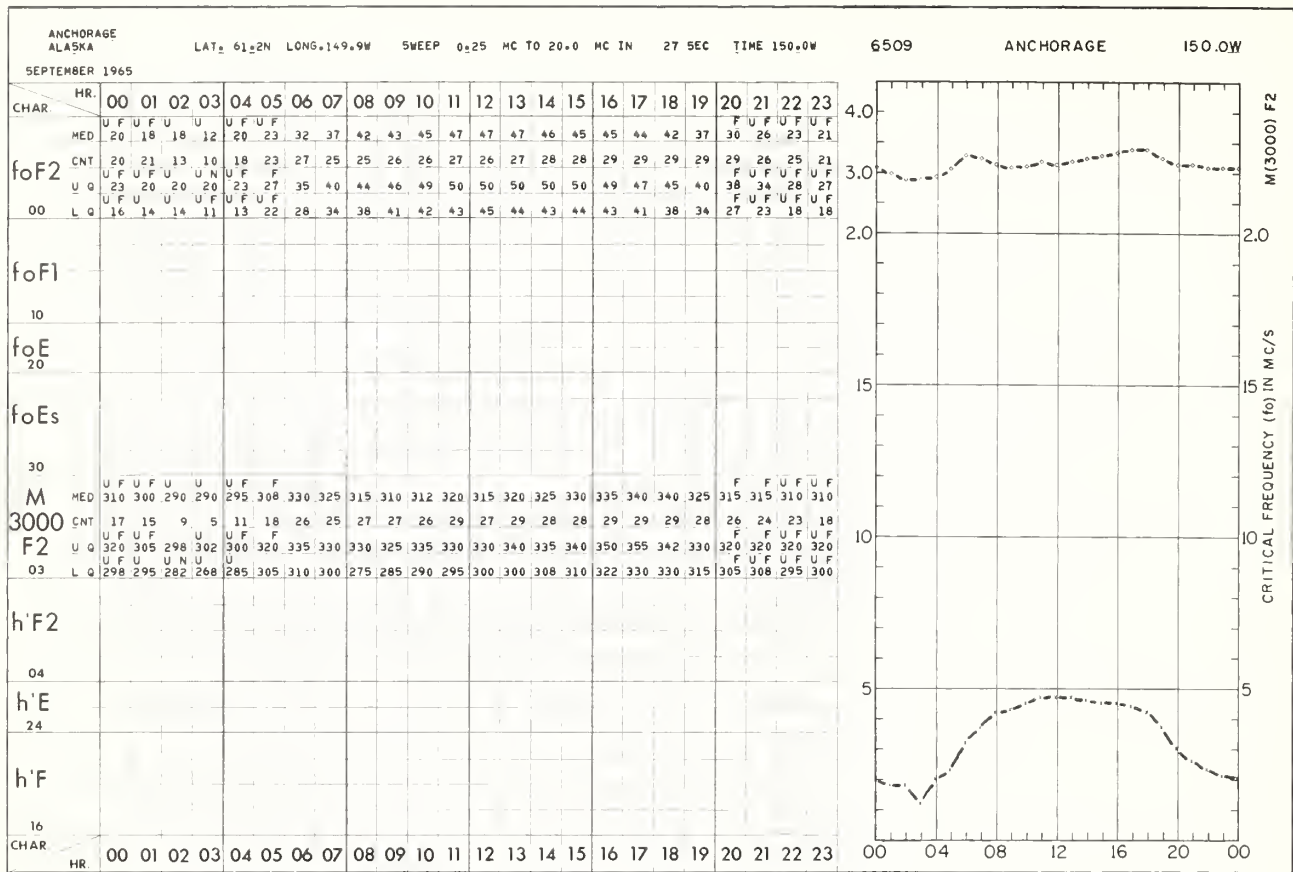
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION,
UNITED STATES OF AMERICA
(INSTITUTE FOR TELECOMMUNICATION SCIENCES AND AERONOMY)
ANCHORAGE, ALASKA
BARROW, ALASKA
BOULDER, COLORADO
BYRD STATION, ANTARCTICA
COLLEGE (FAIRBANKS), ALASKA (GEOPHY INST OF UNIV OF ALASKA)
FT. BELVOIR, VIRGINIA
HUANCAYO, PERU (INSTITUTO GEOFISICO DEL PERU)
MAUI, HAWAII
POLE STATION, ANTARCTICA
TALARA, PERU (INSTITUTO GEOFISICO DEL PERU)

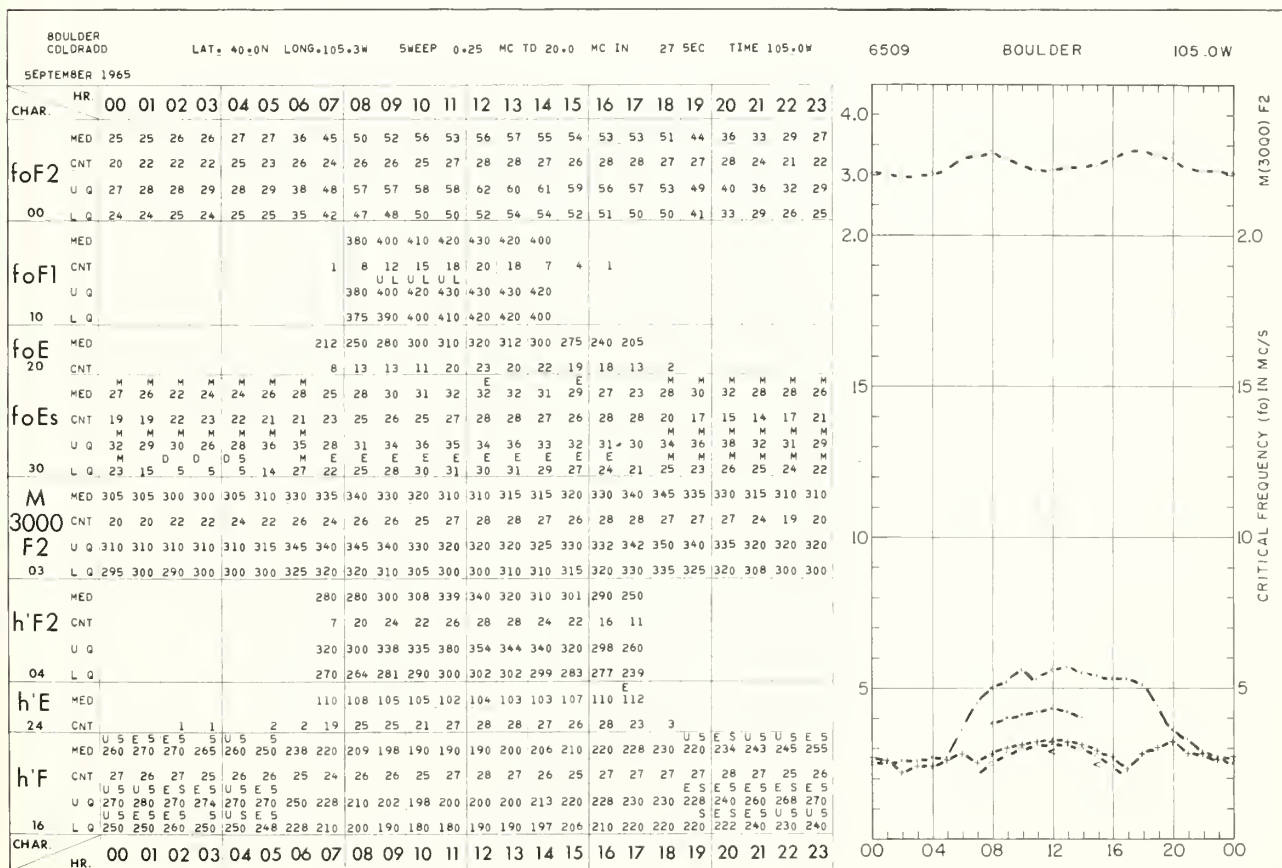
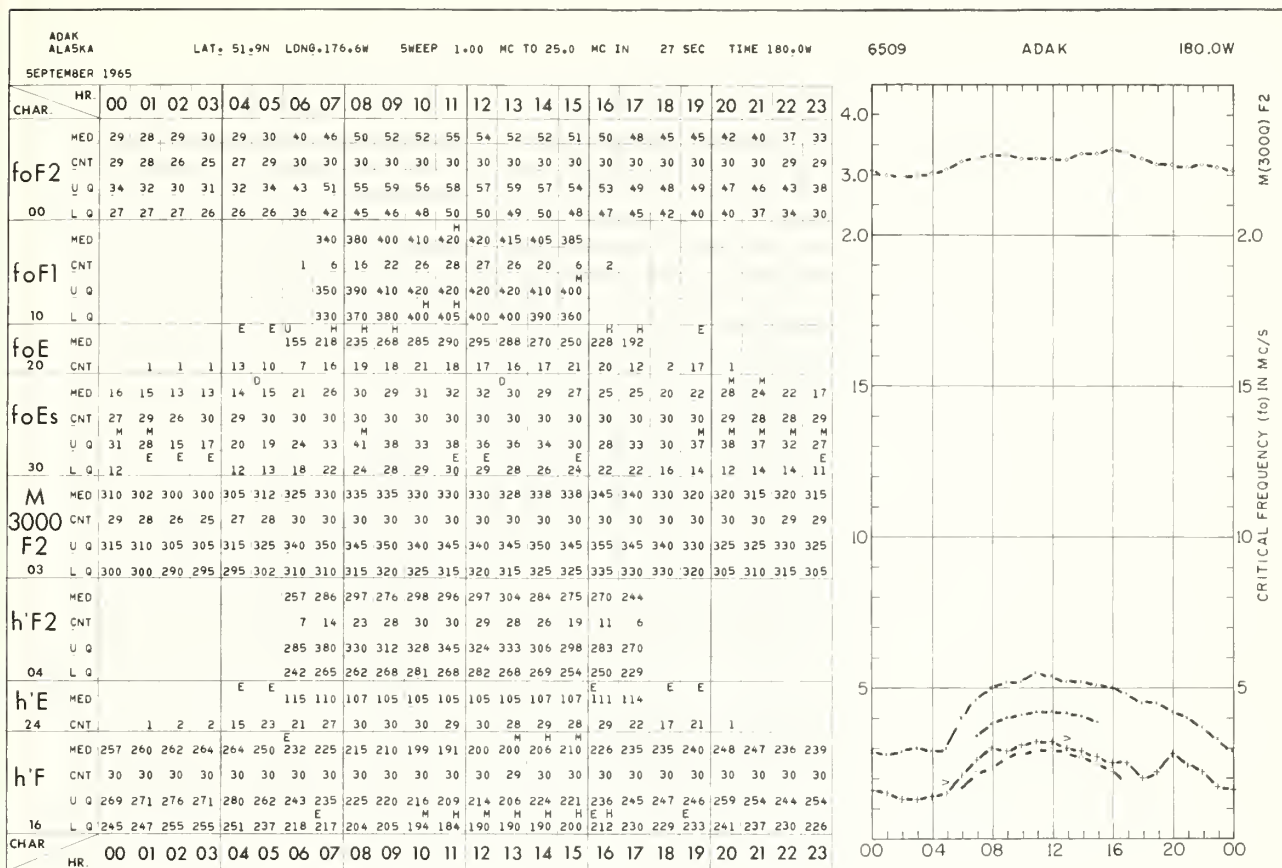
ACADEMY OF SCIENCES OF THE U.S.S.R.
SOVIET GEOPHYSICAL COMMITTEE
MOSCOW, U.S.S.R.

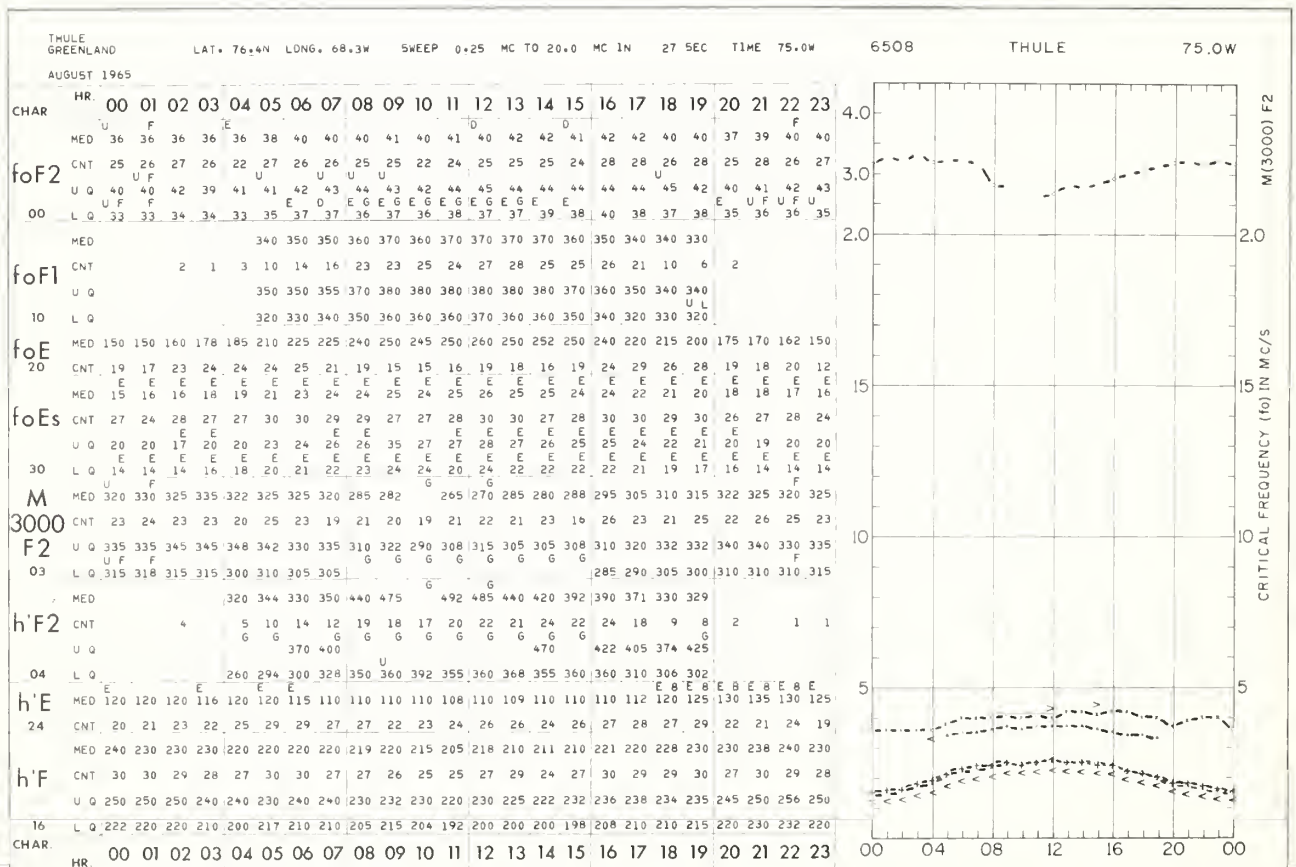
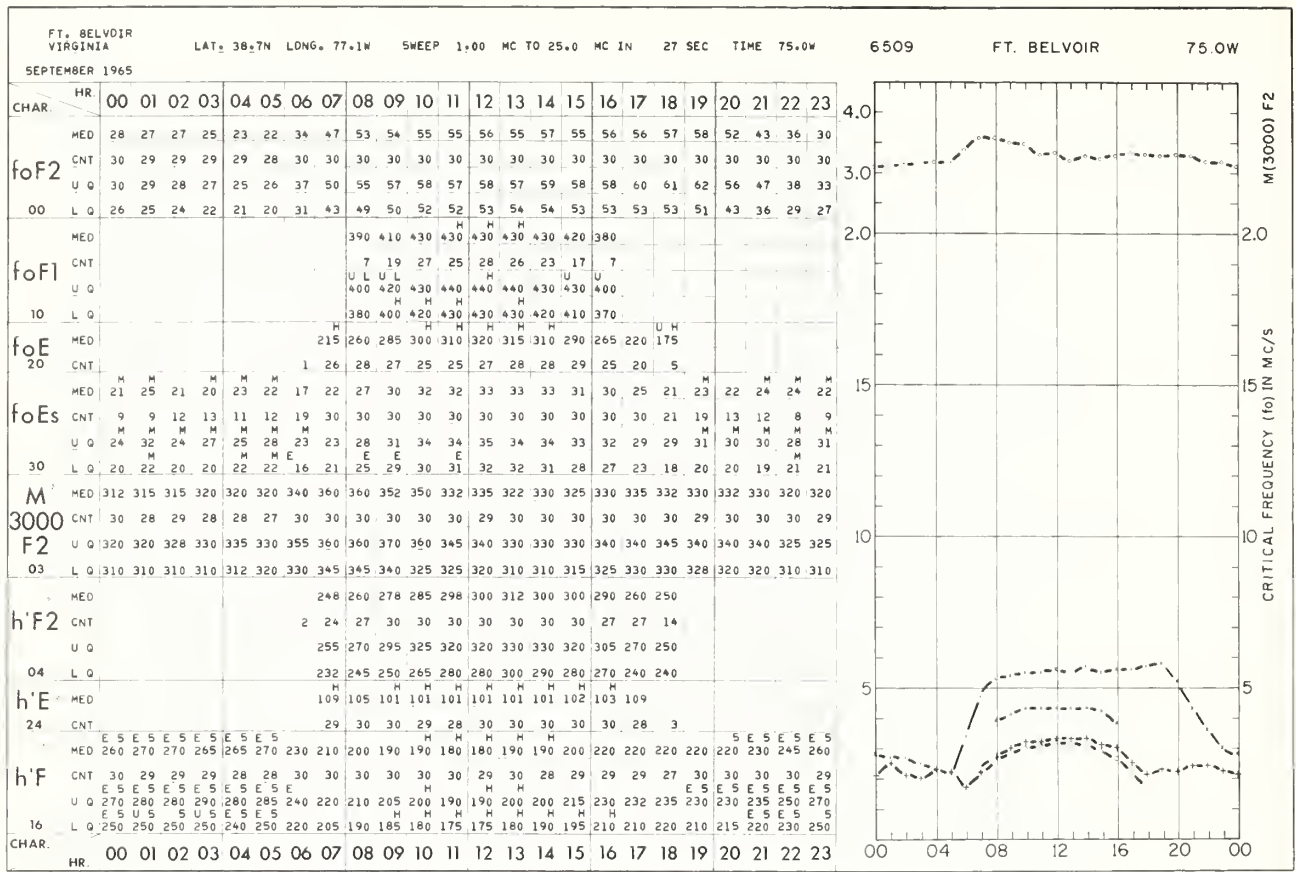
TABLES AND GRAPHS OF IONOSPHERIC DATA

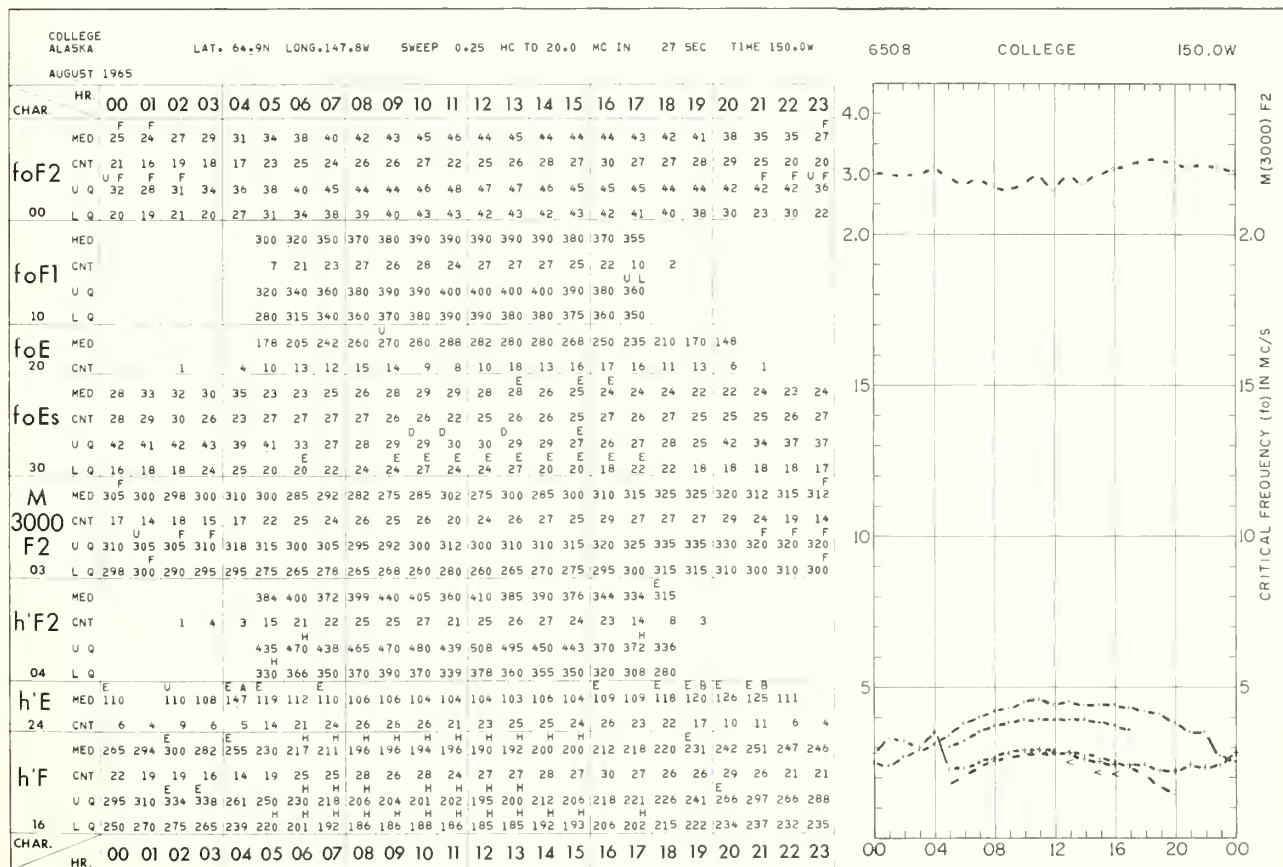
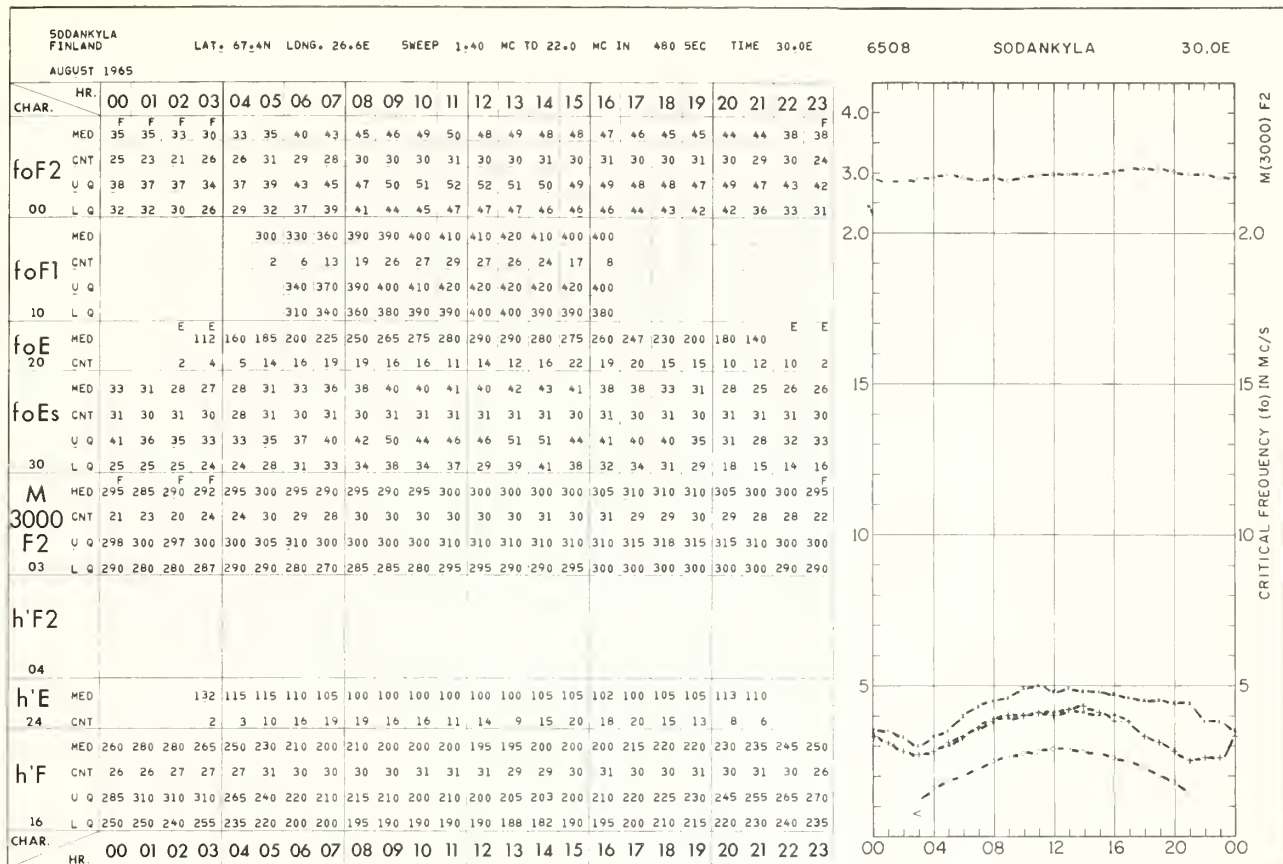
September 1965 - March 1964

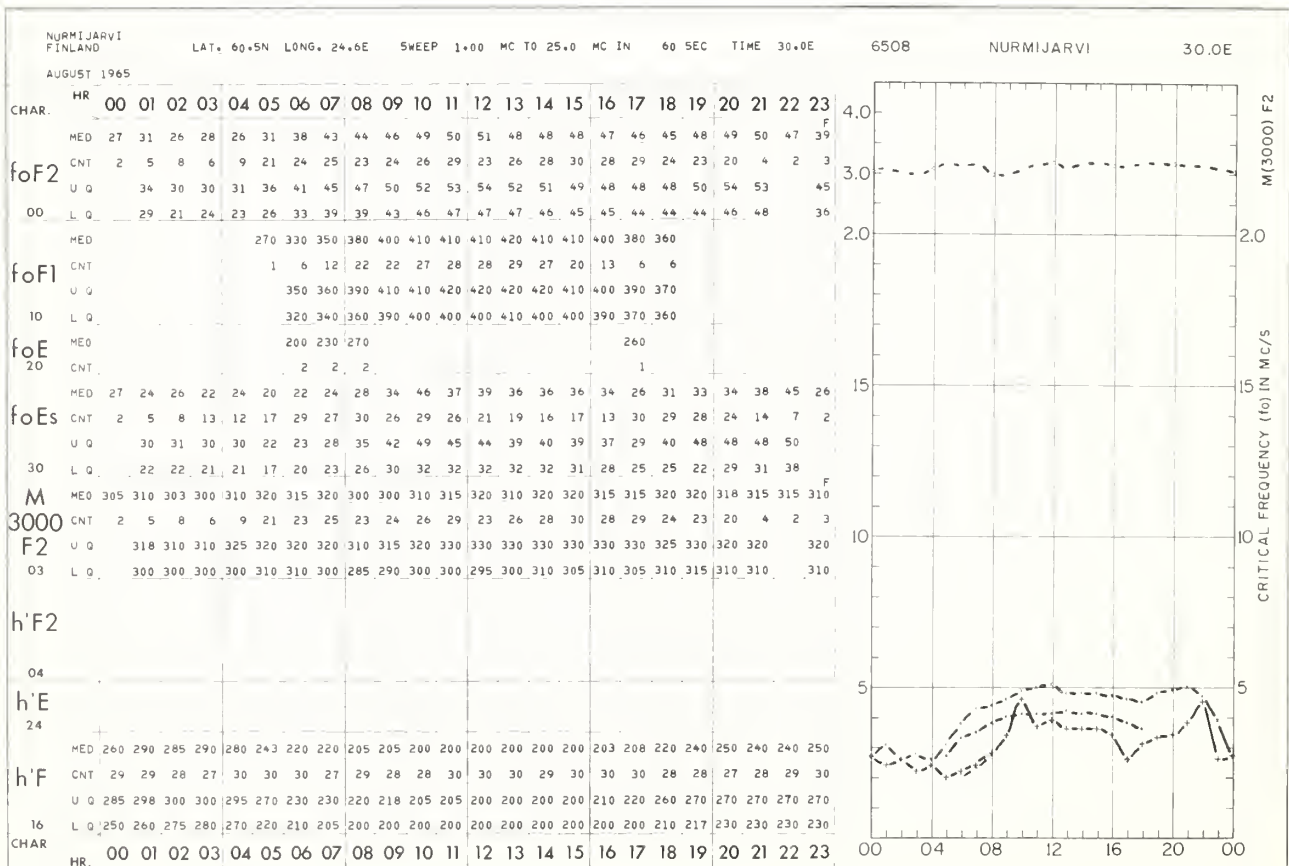
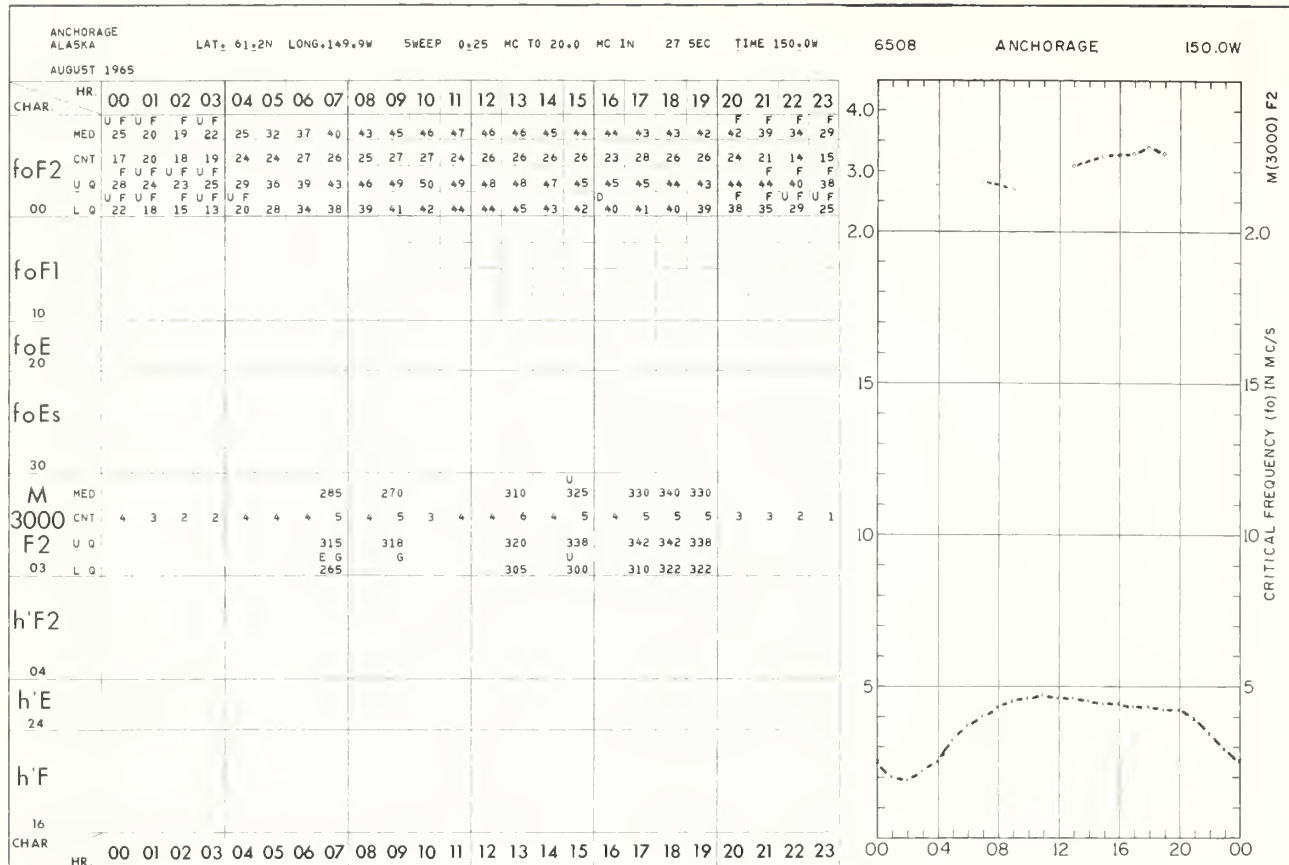


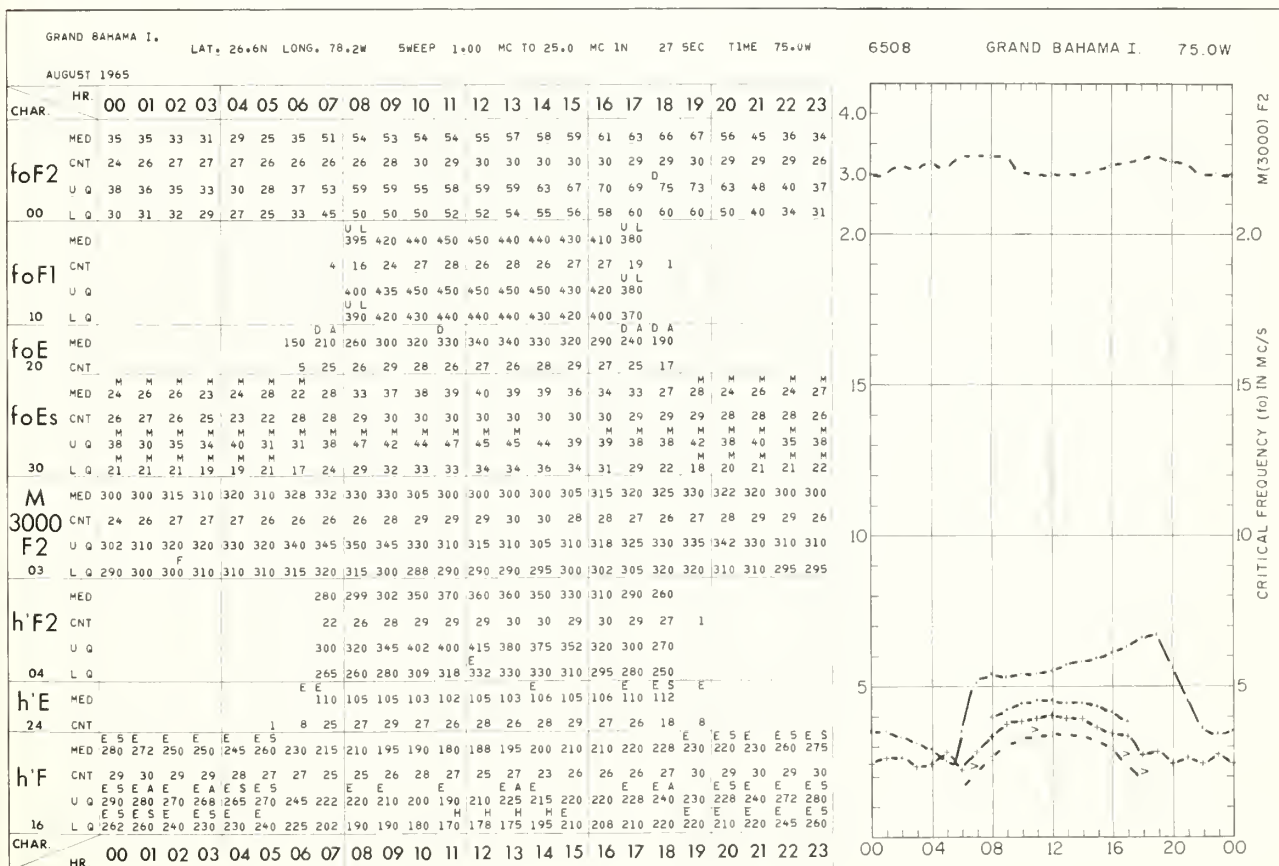
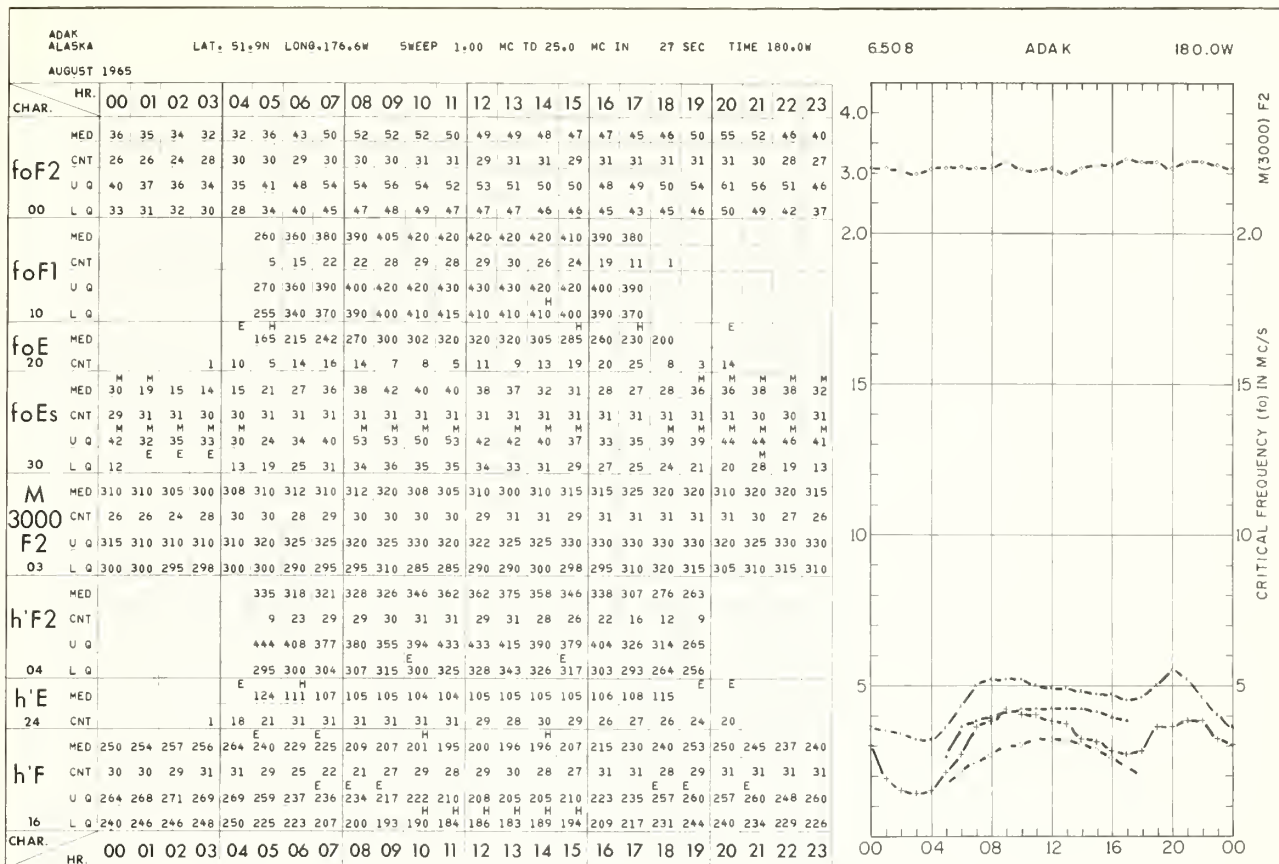


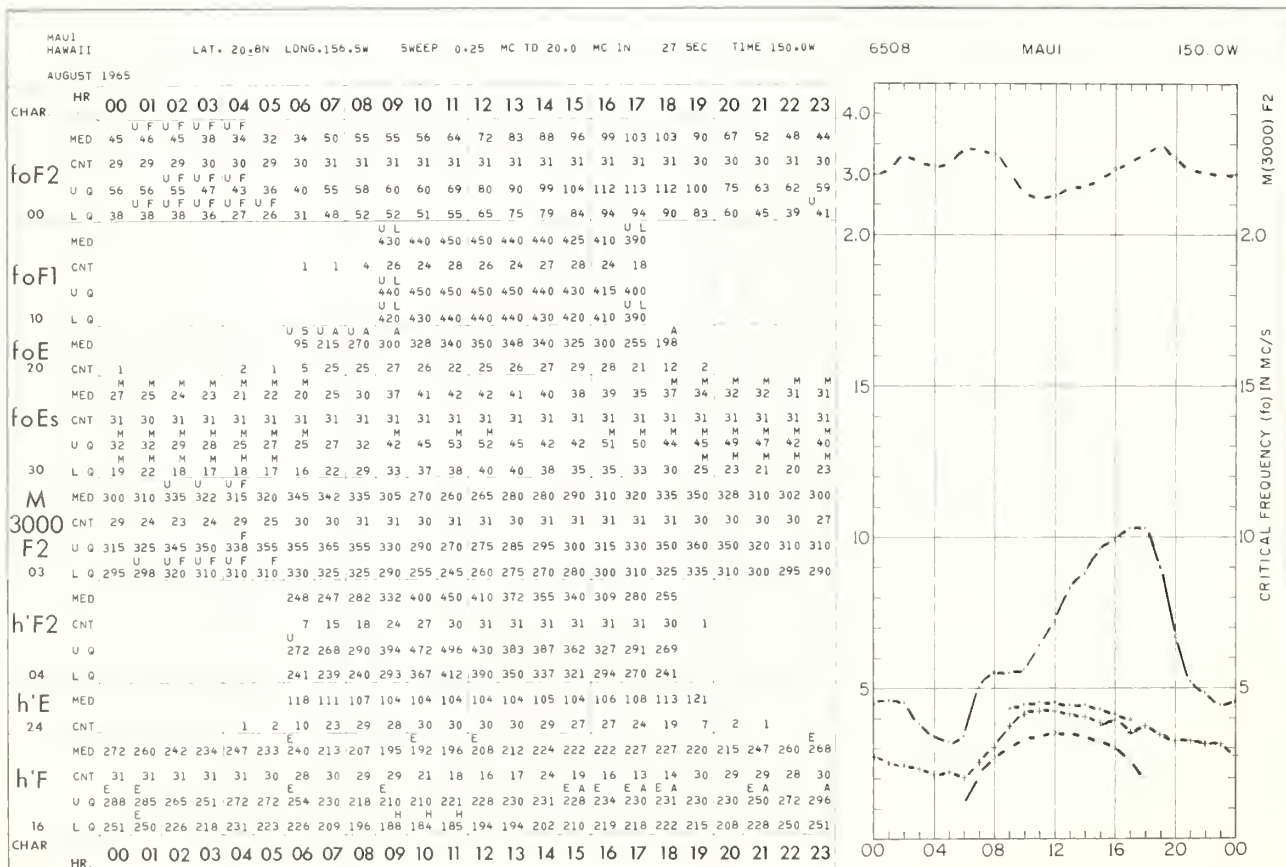
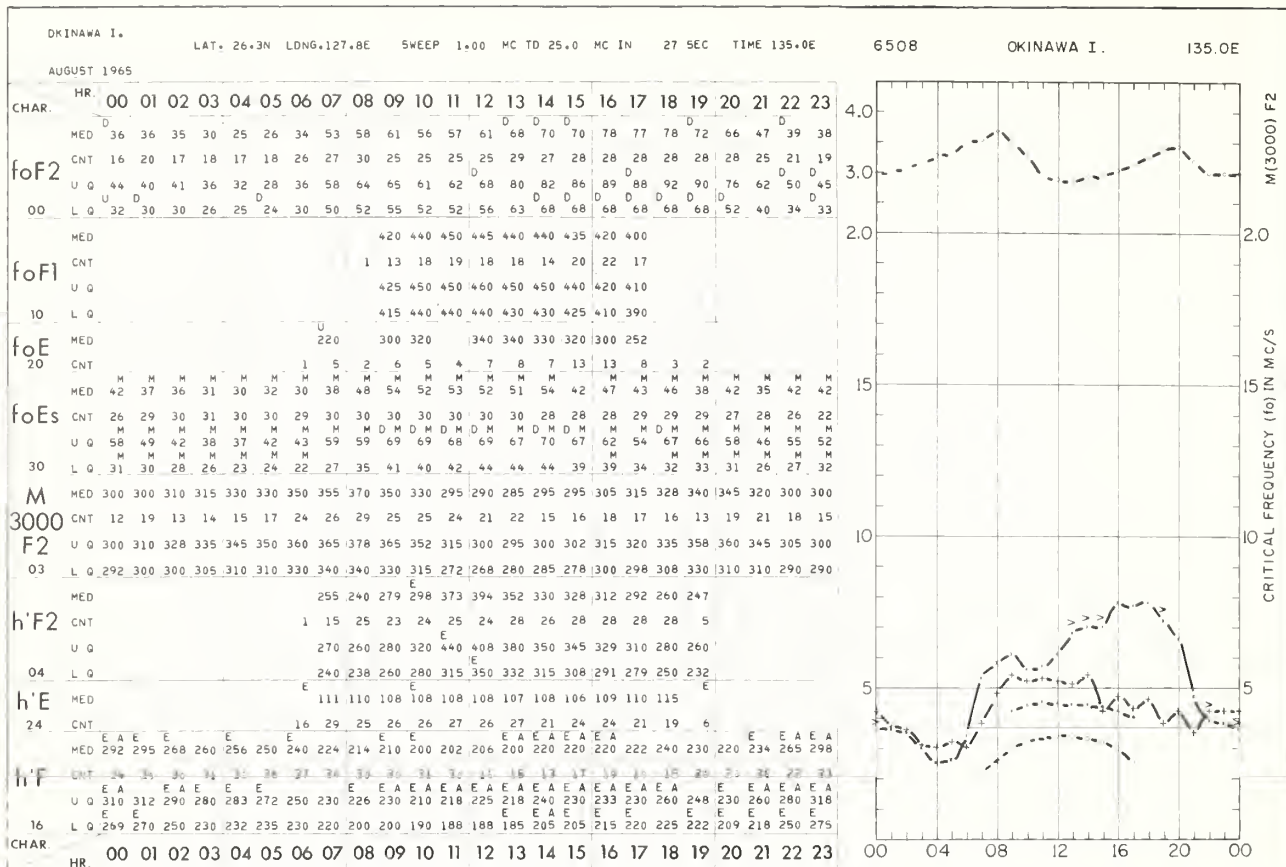


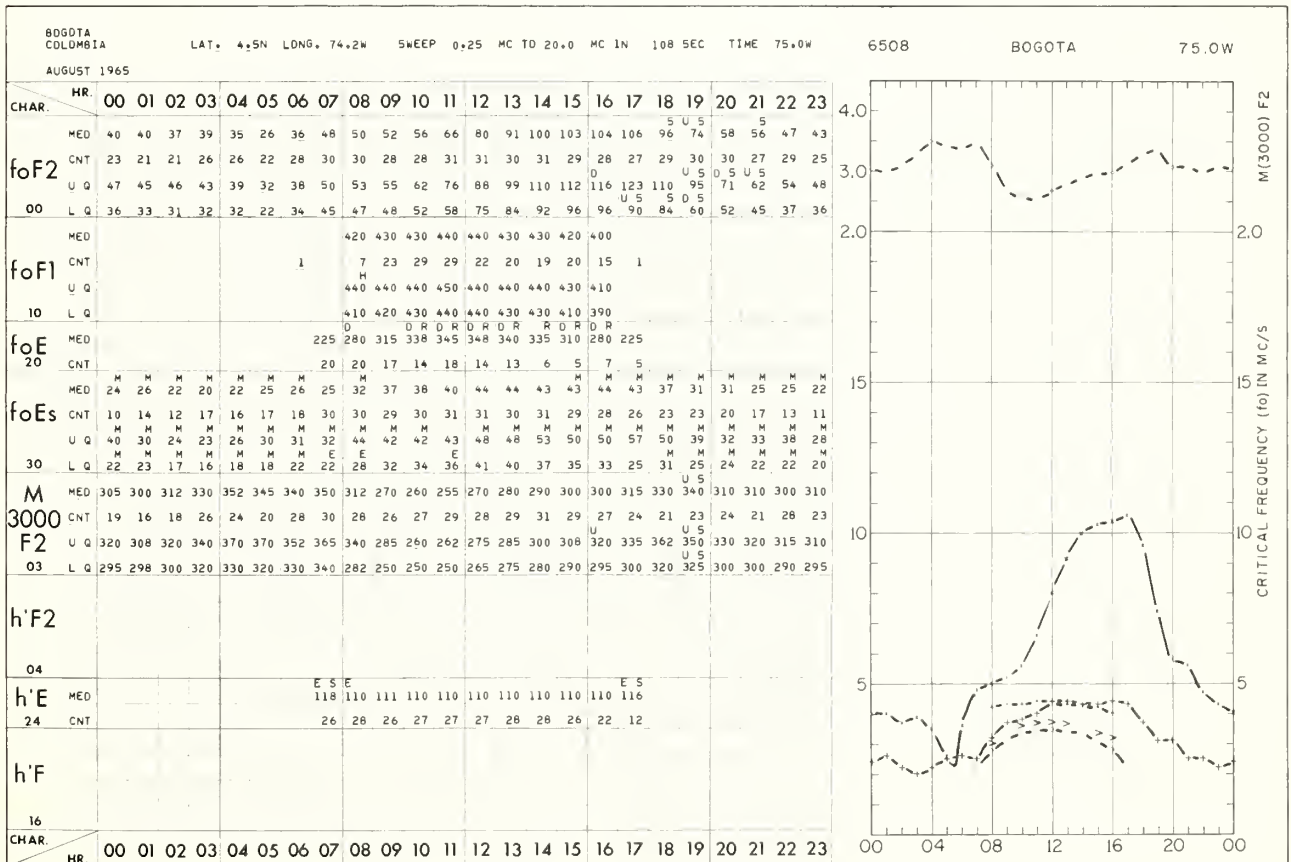
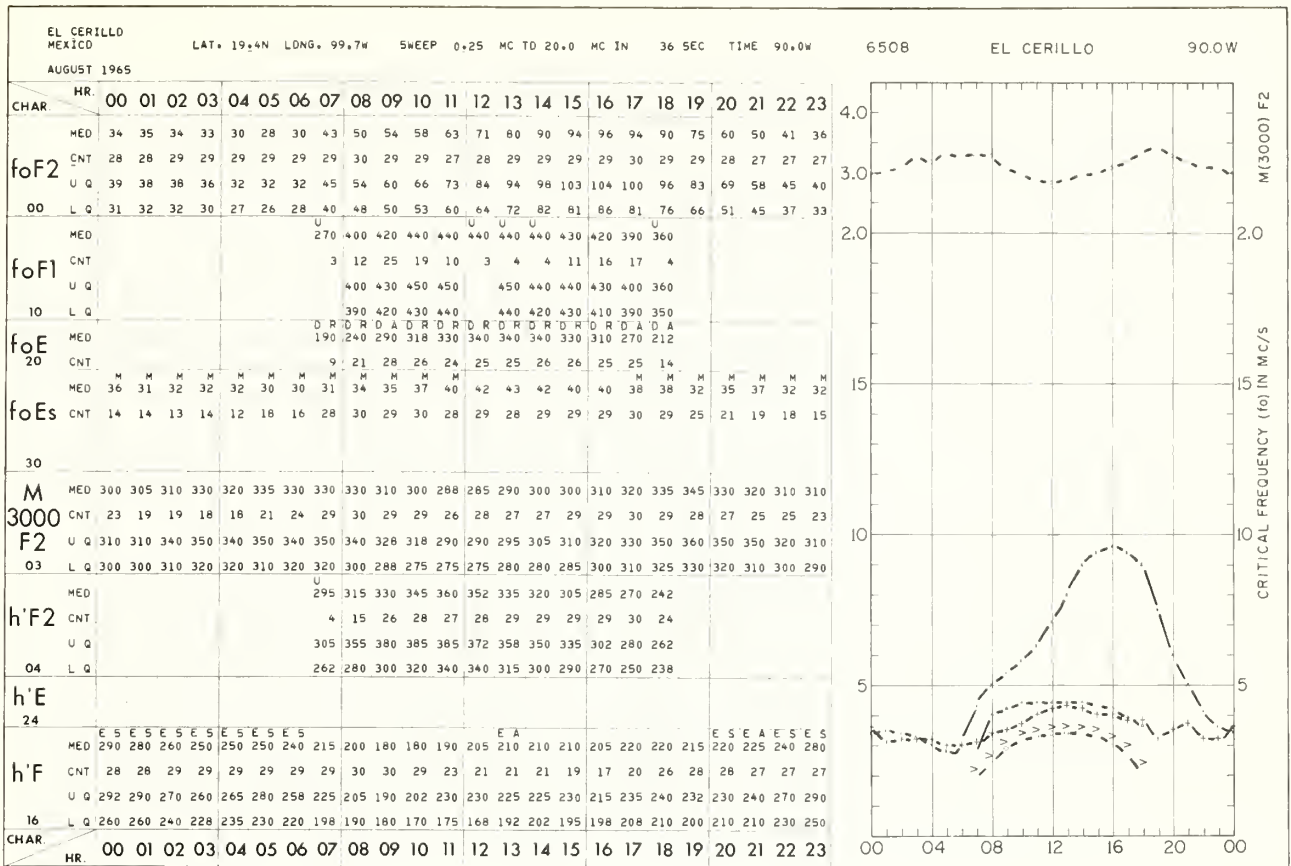


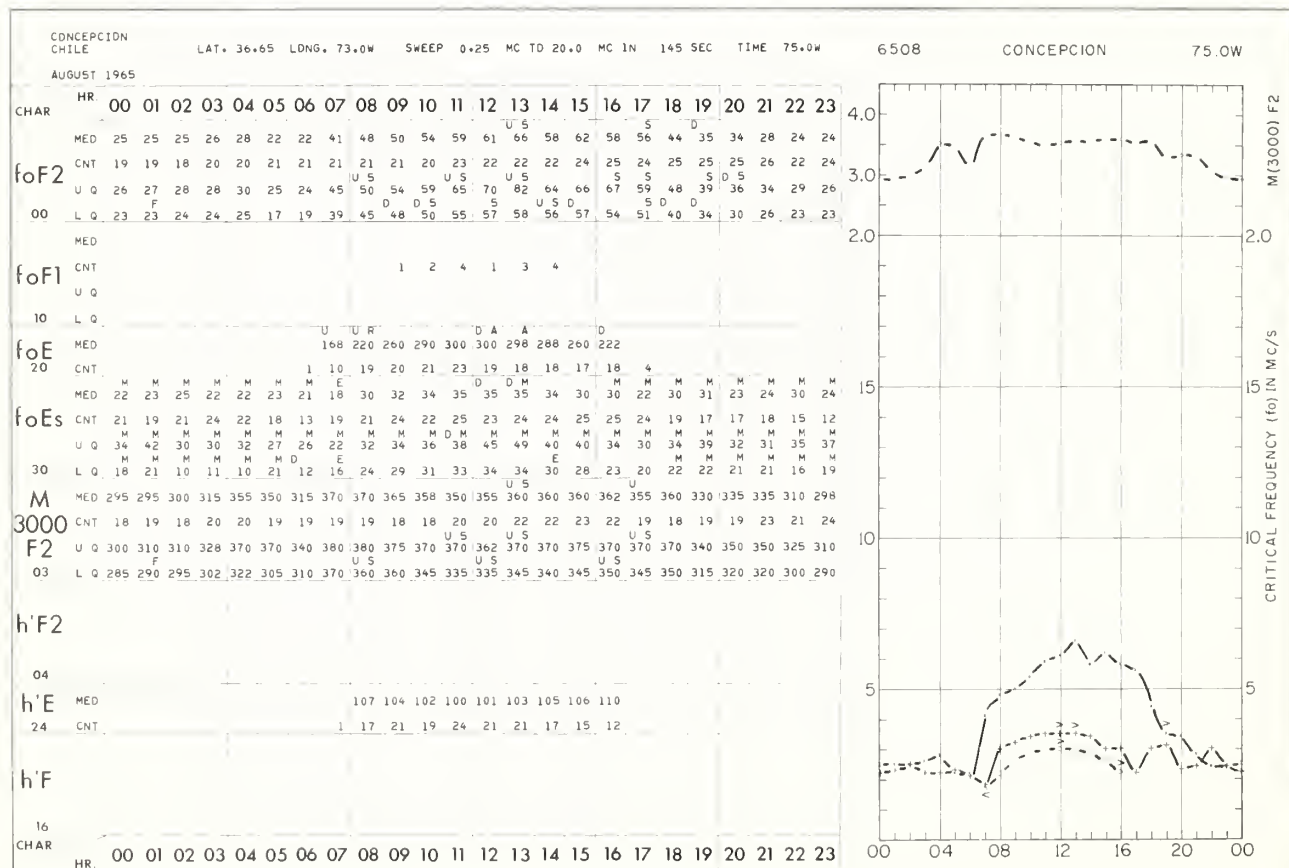
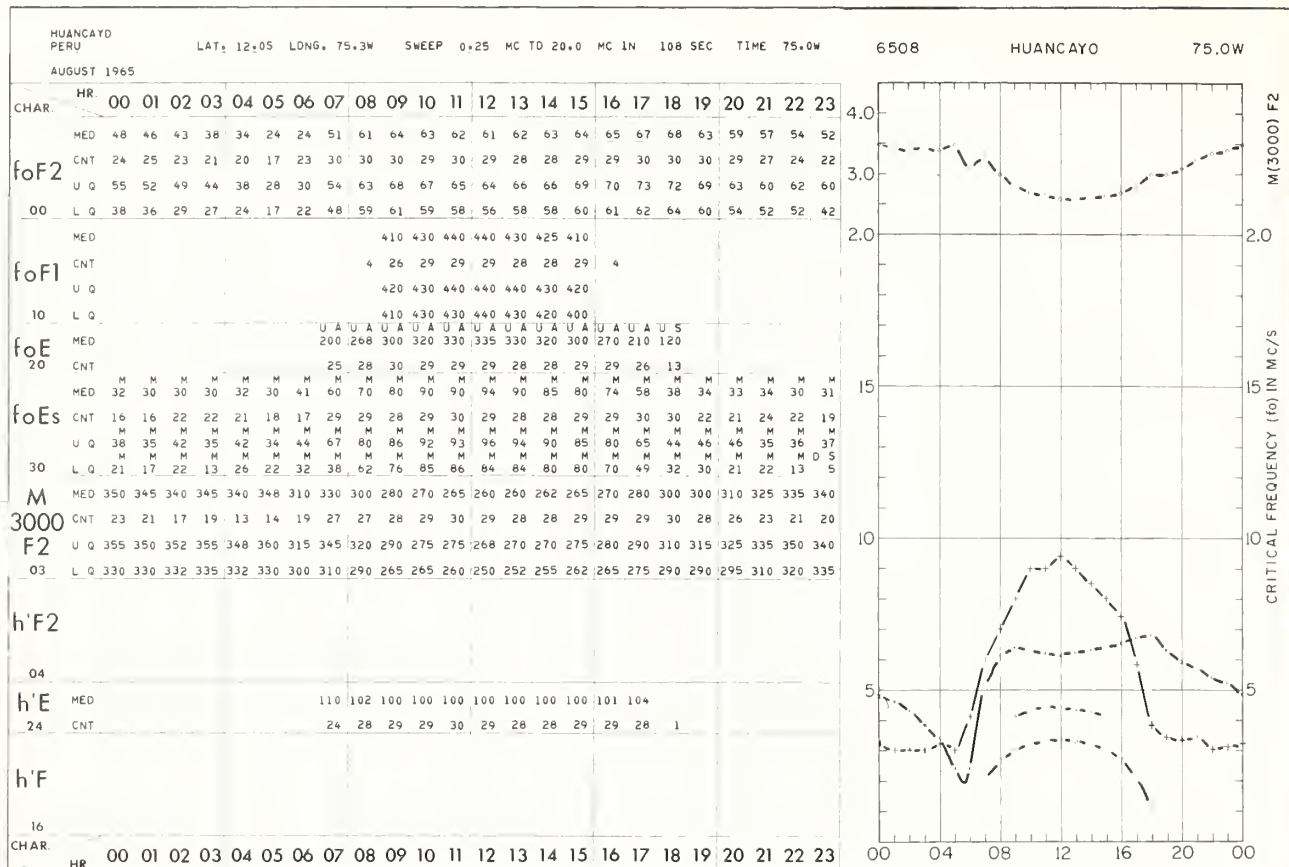


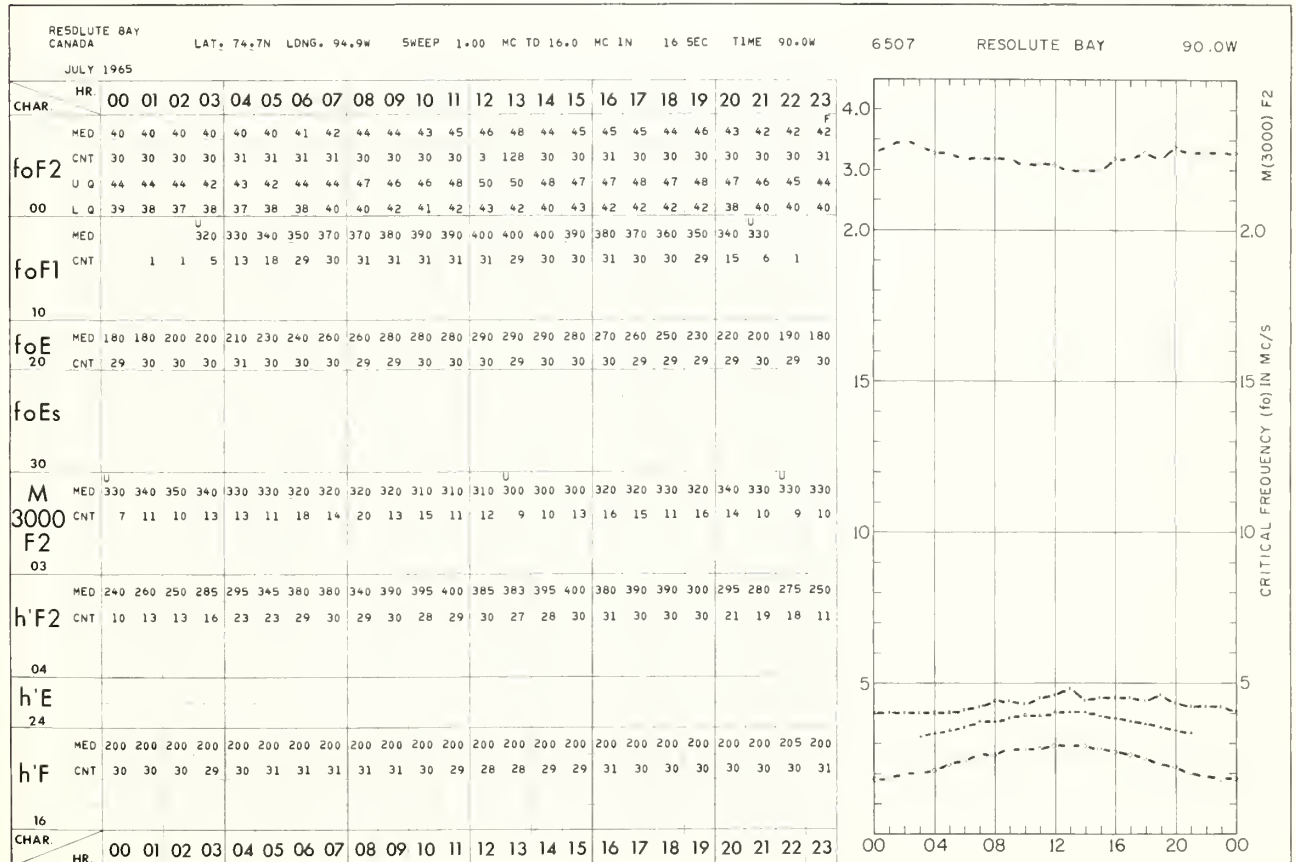
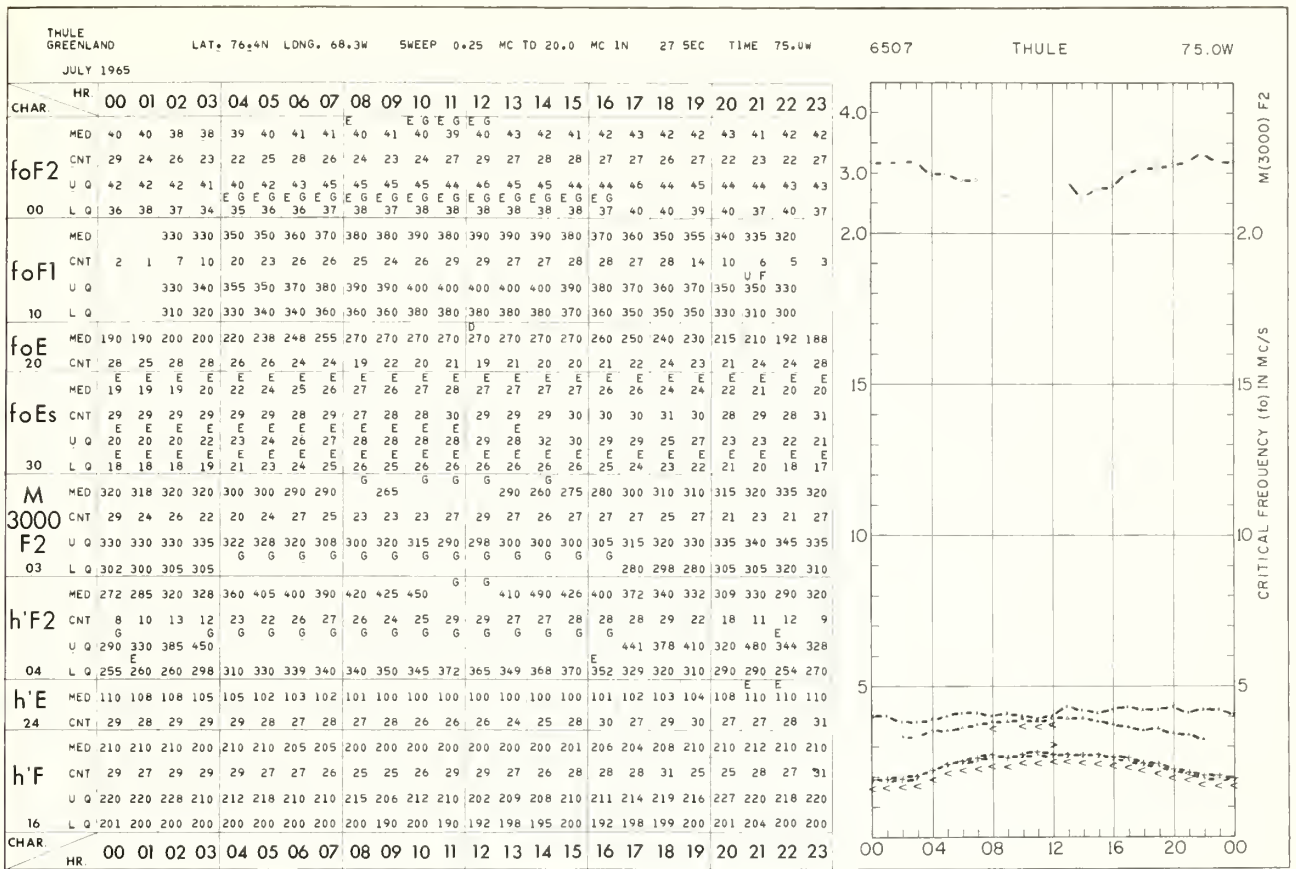


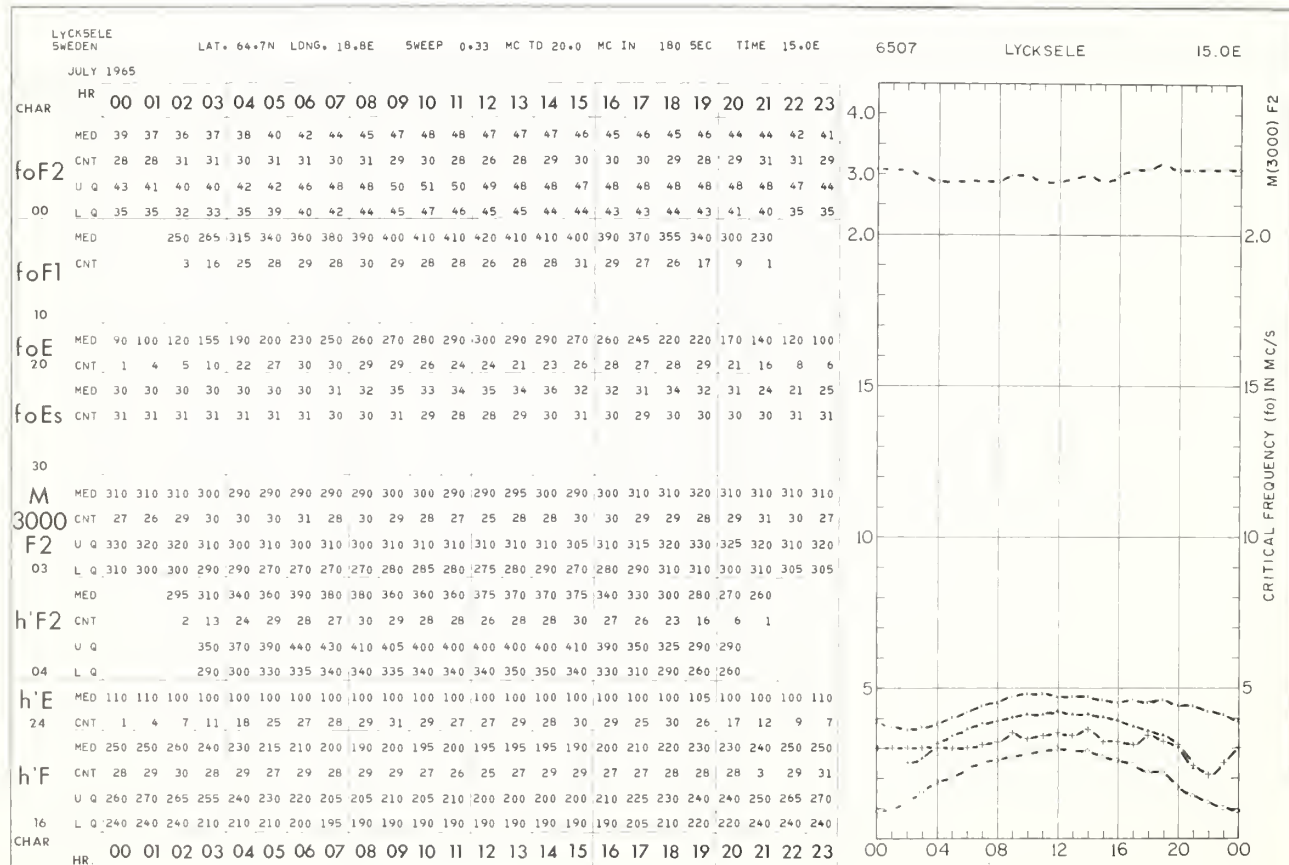
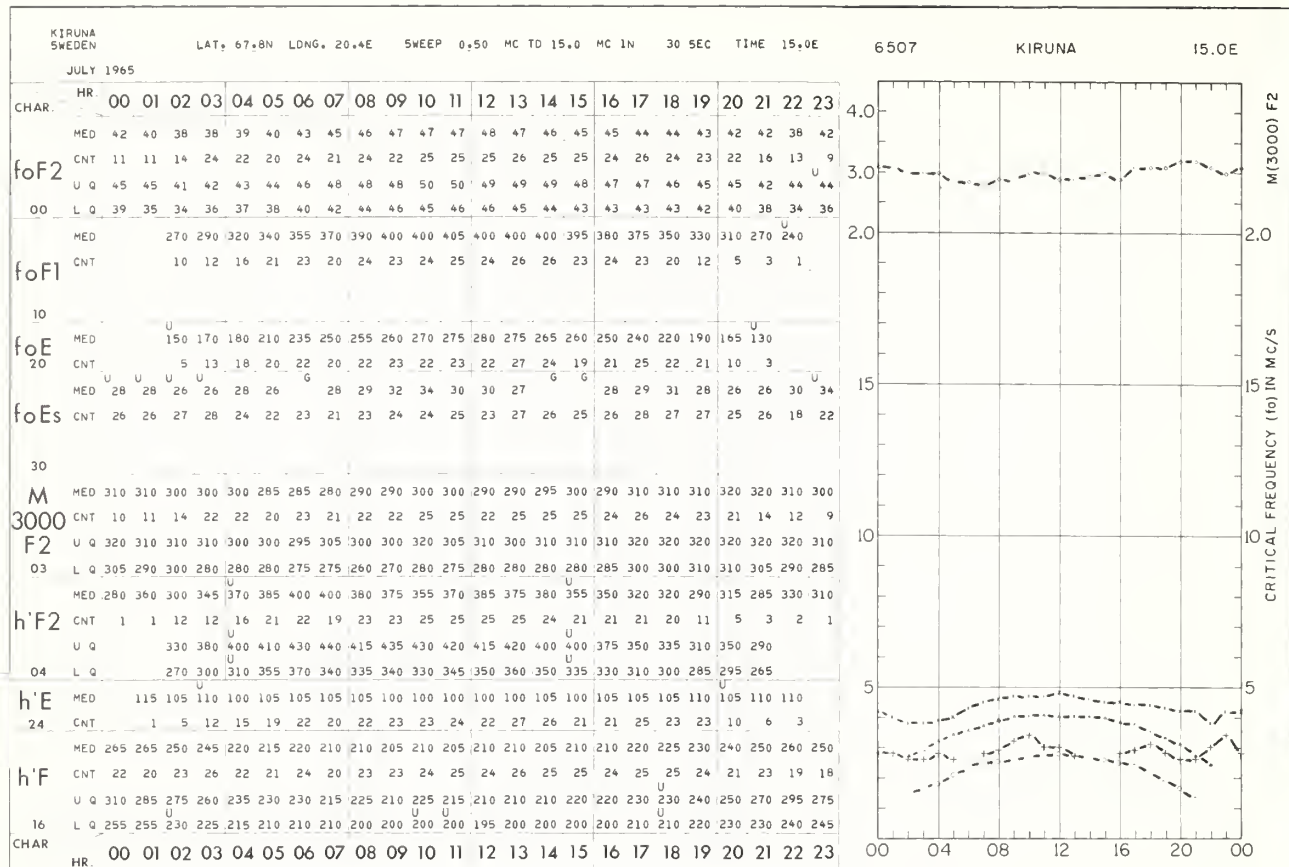


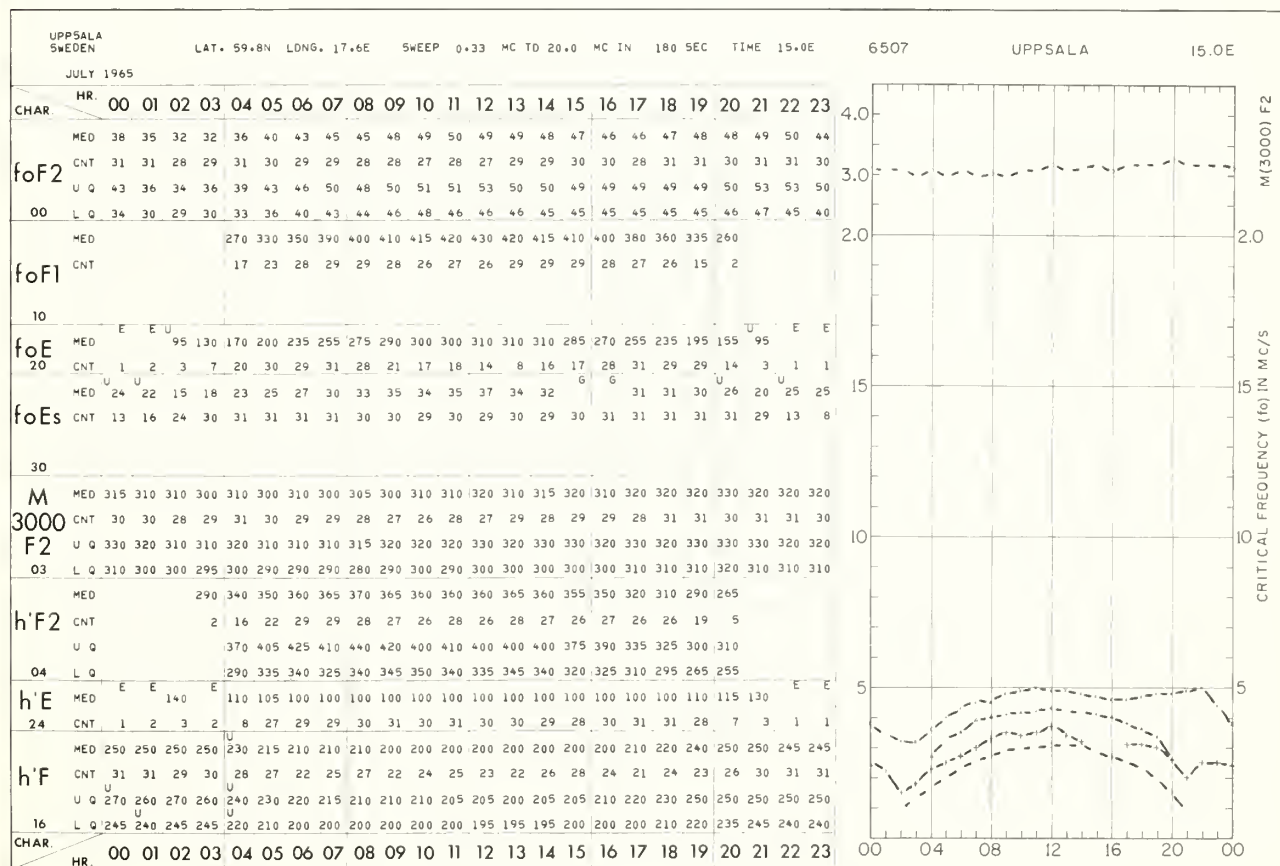
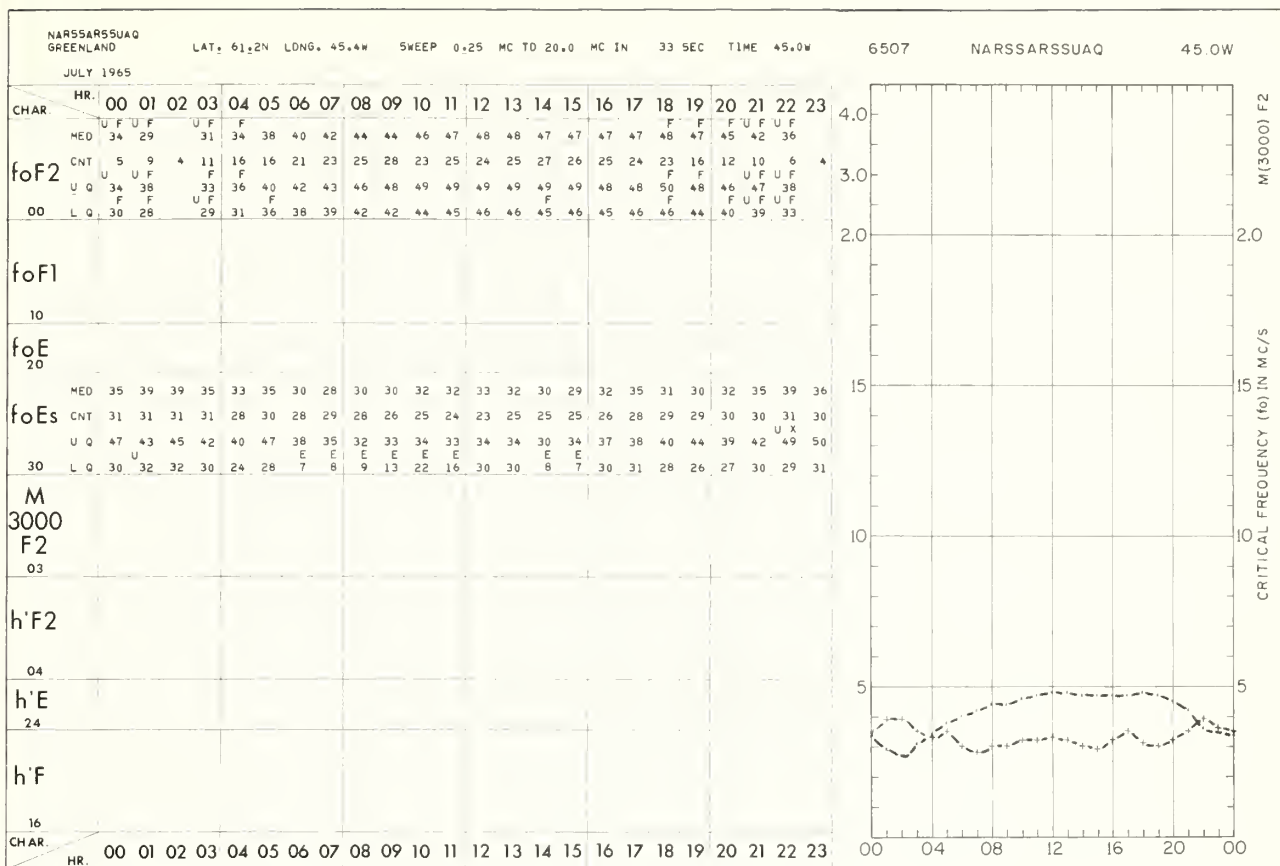


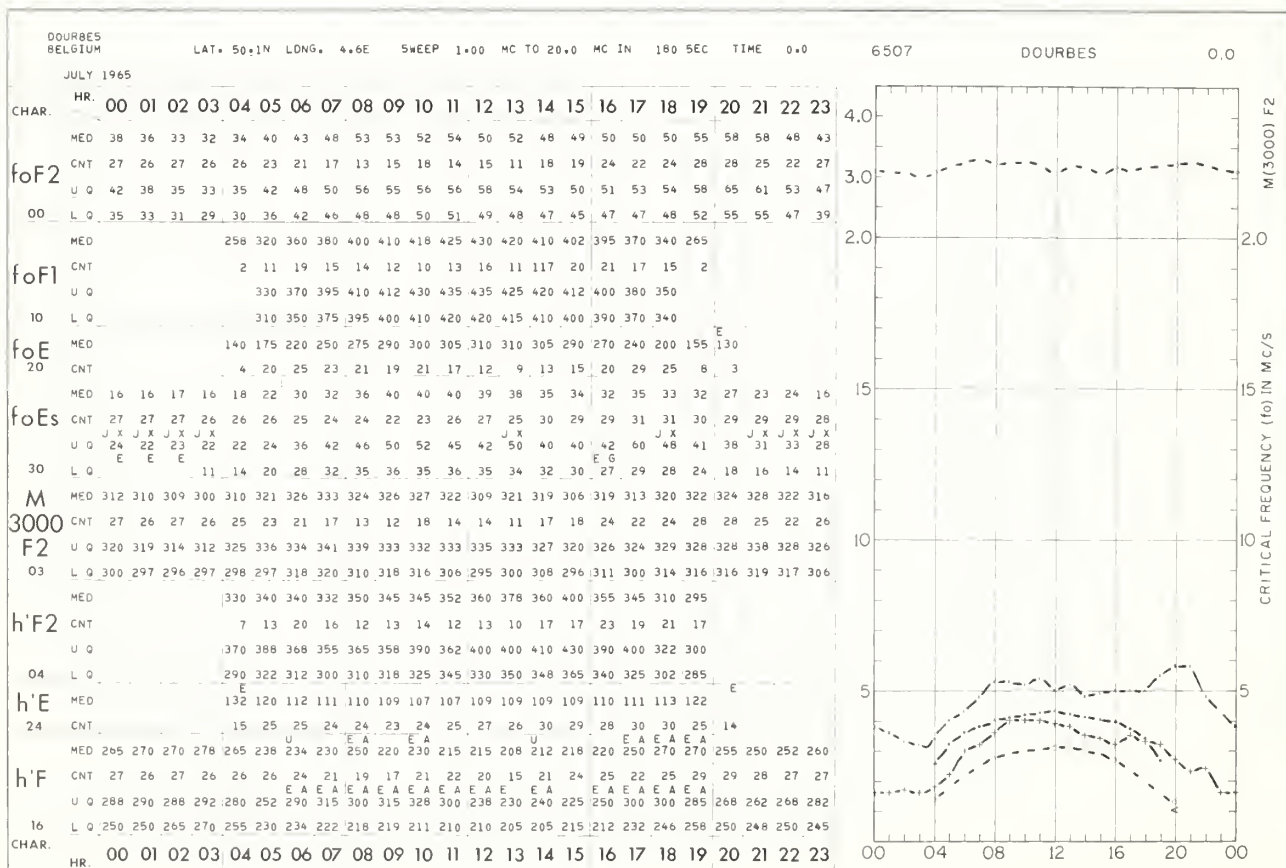
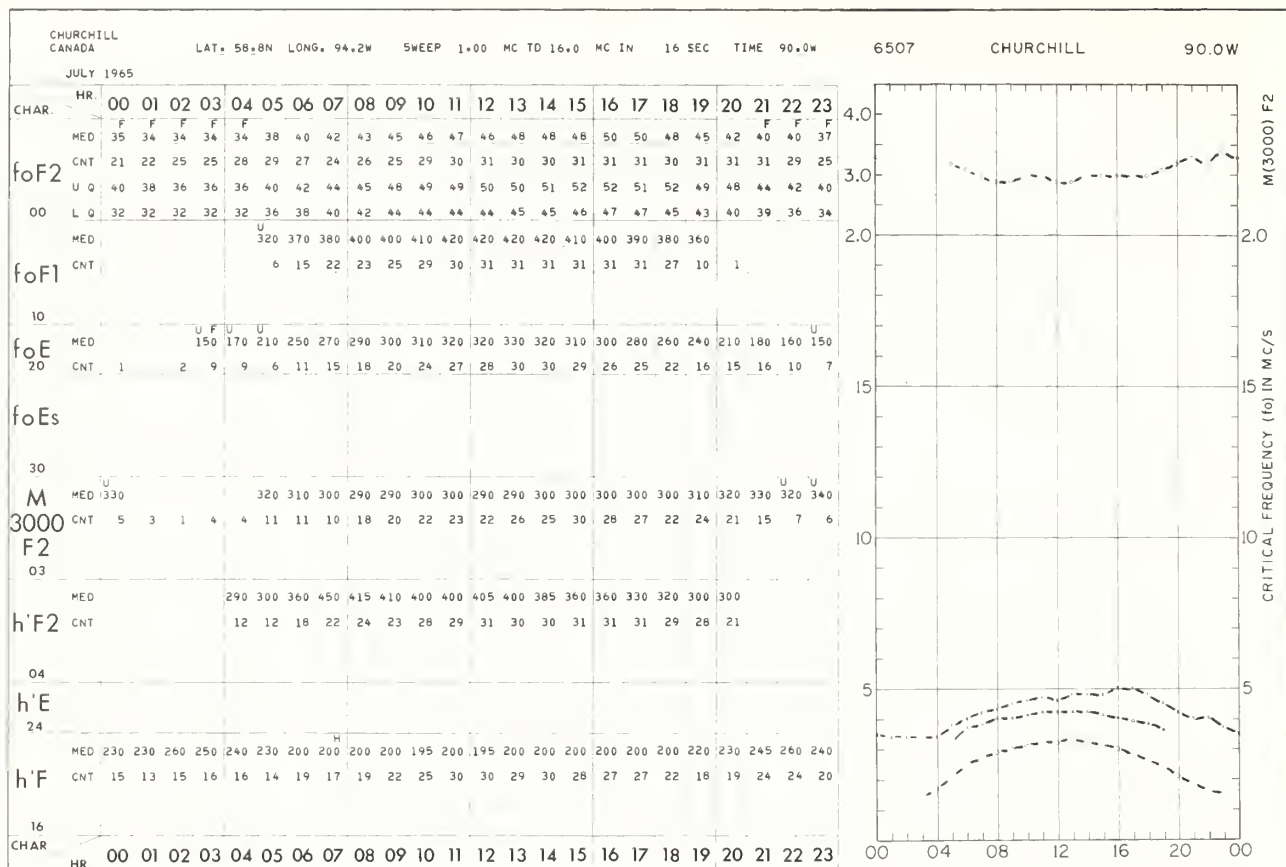


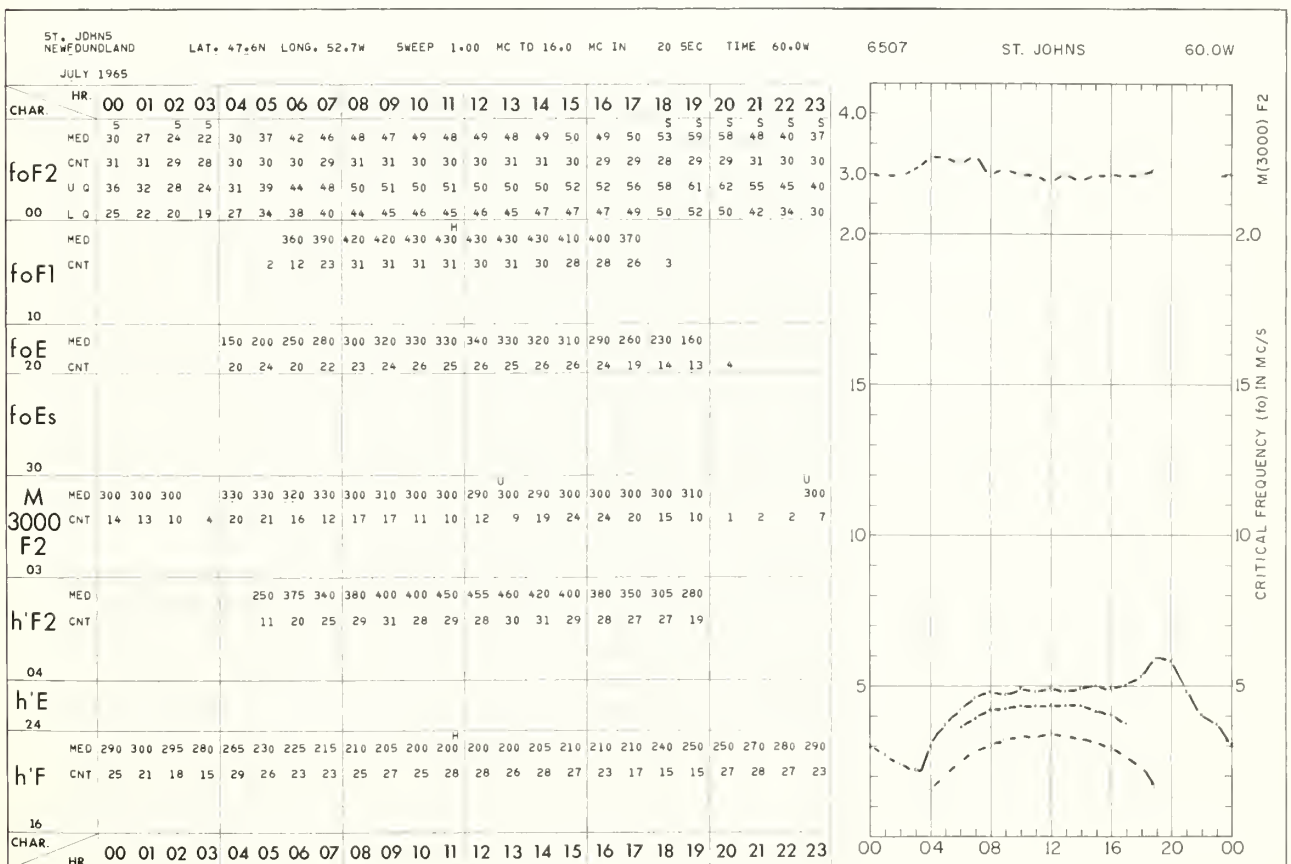
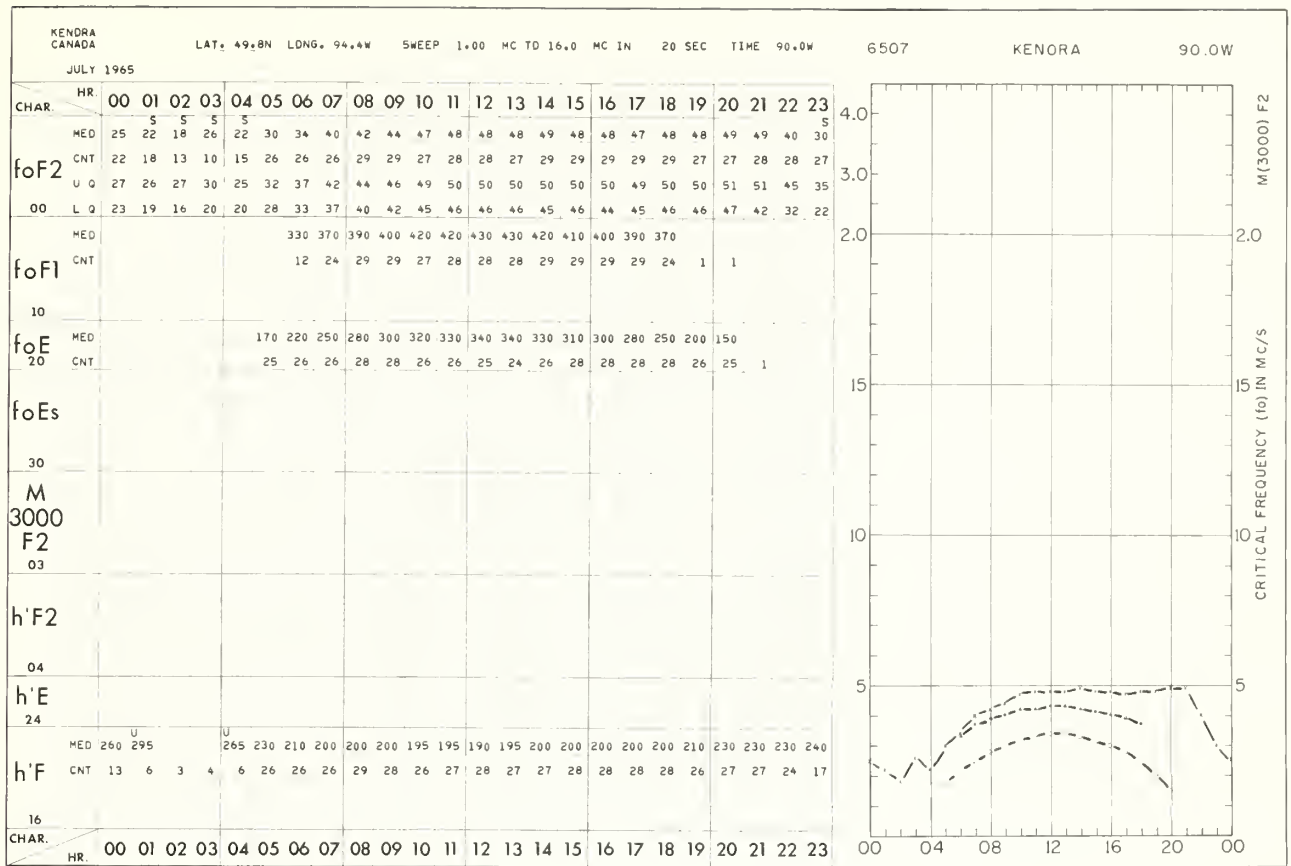


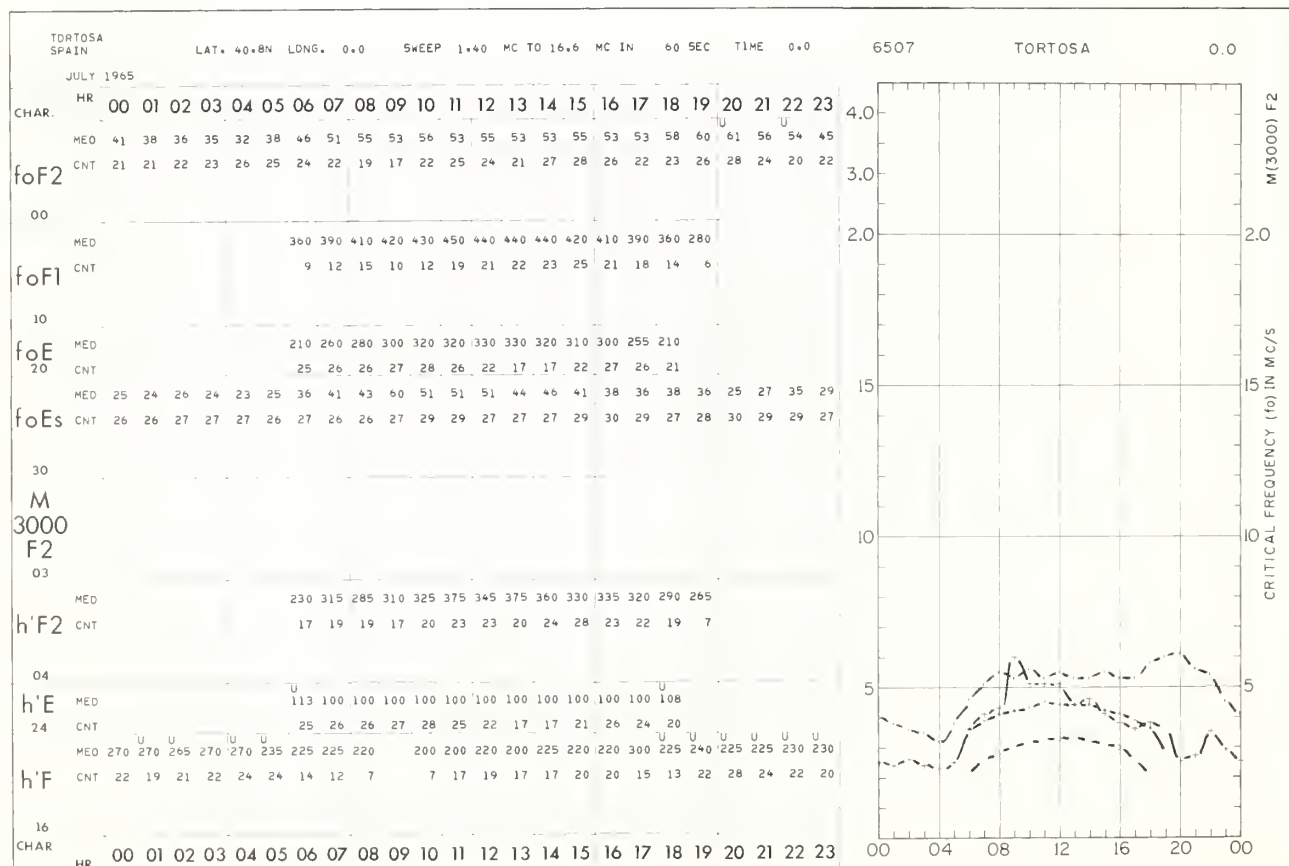
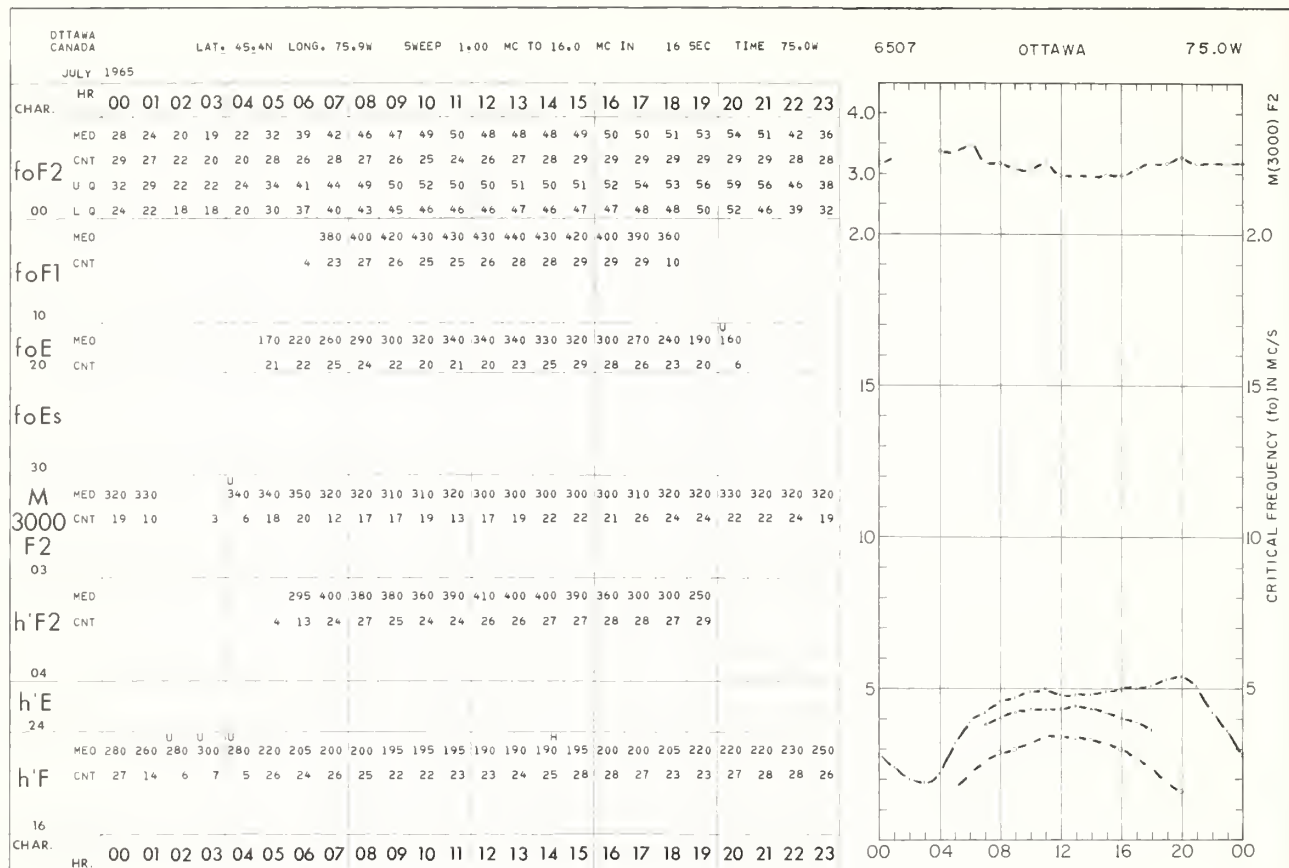


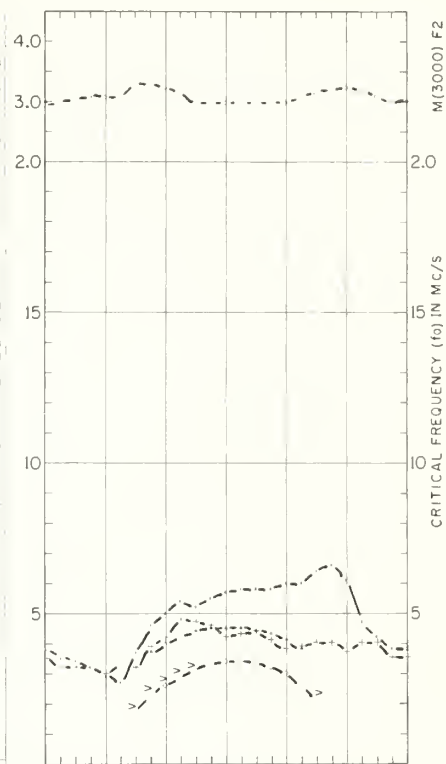




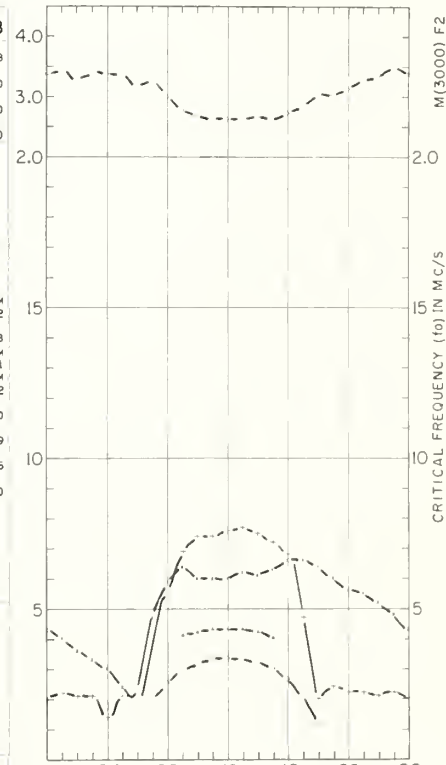


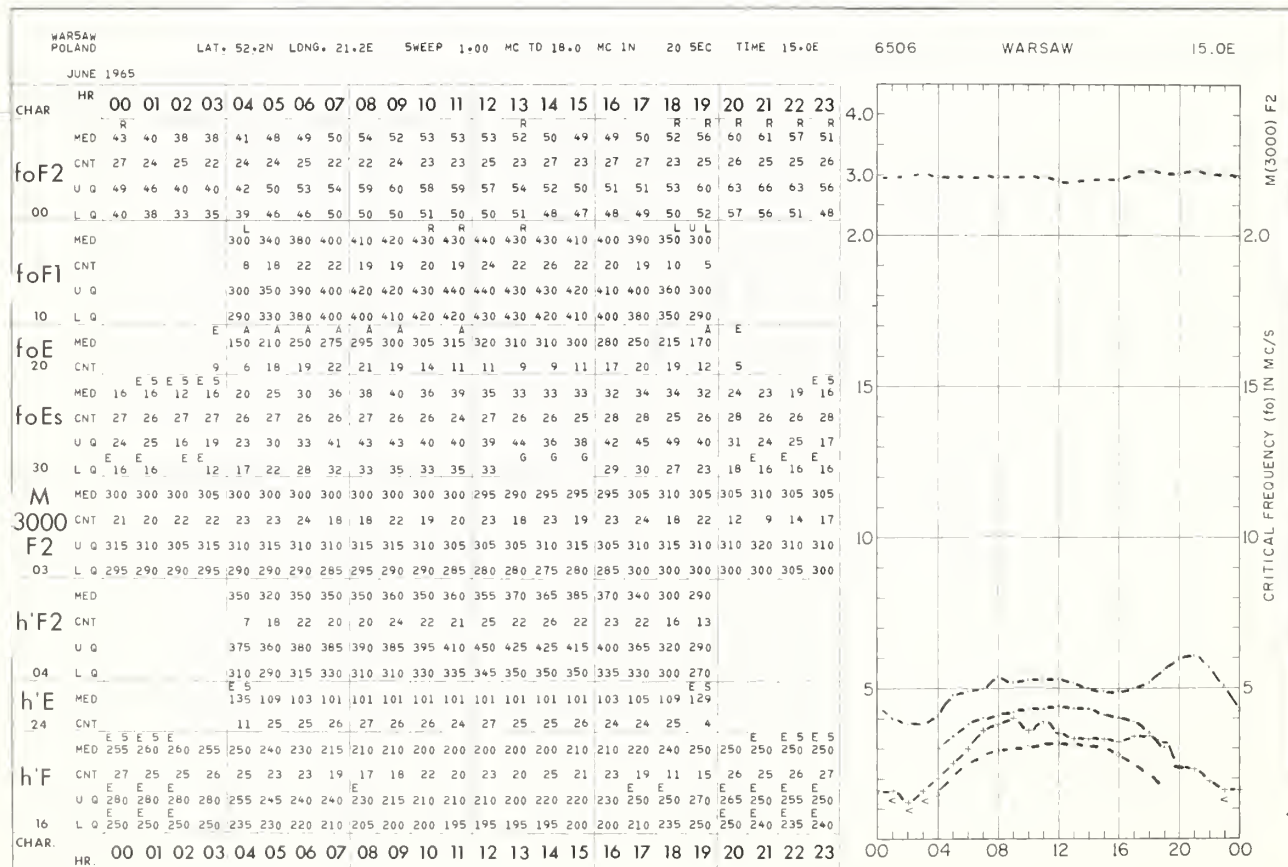
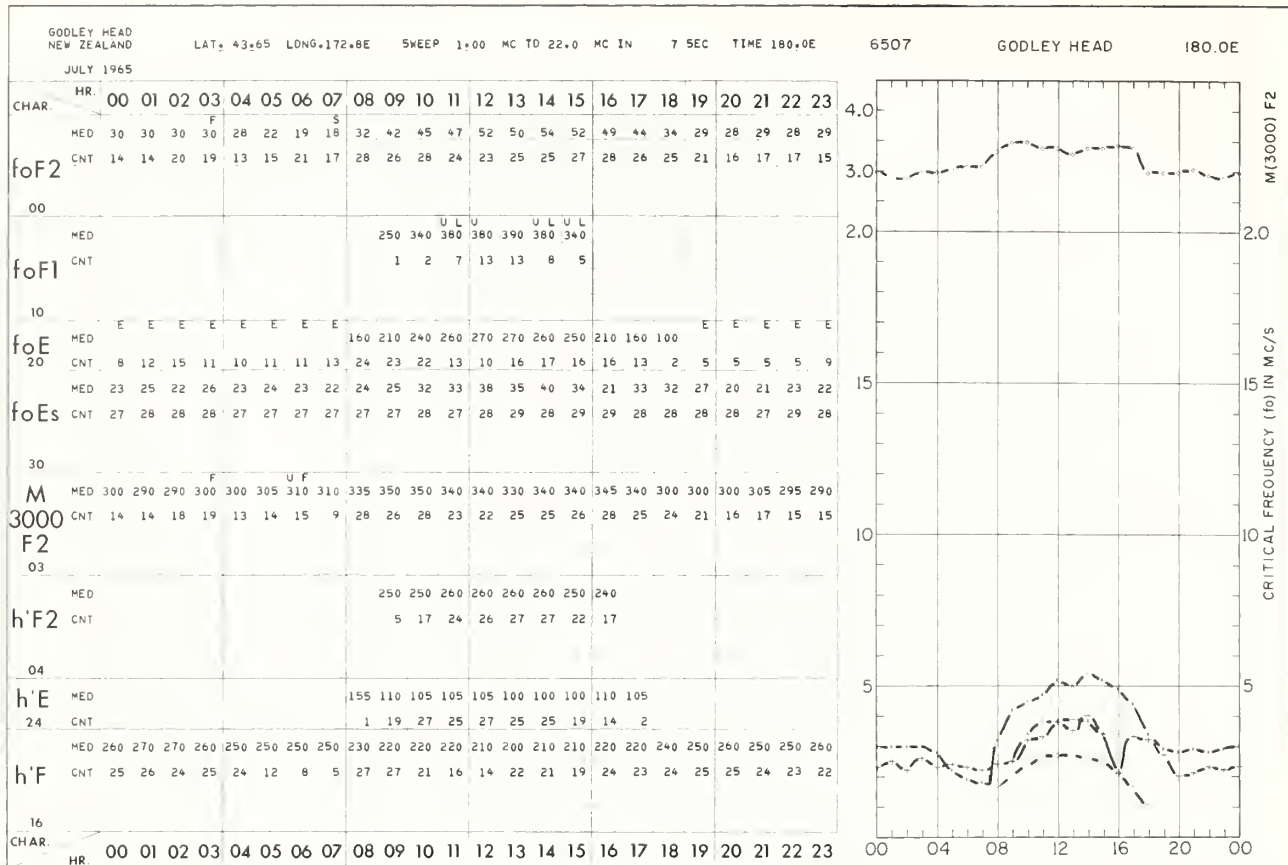






75.0W

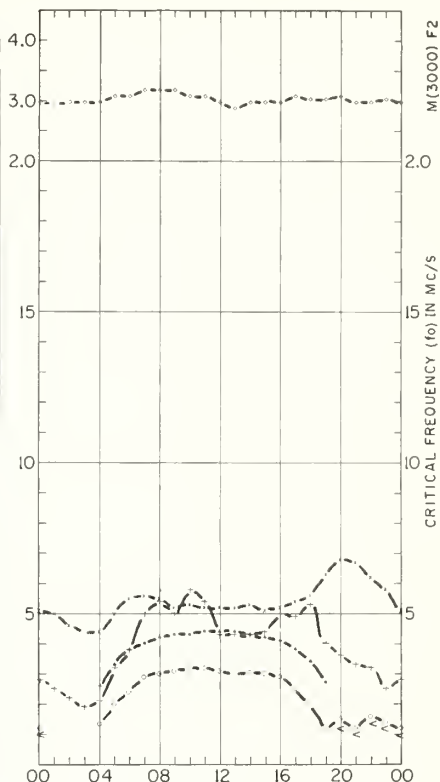




WAKKANAI JAPAN LAT. 45.4N LONG. 141.7E SWEEP 1.00 MC TO 18.0 MC IN 40 SEC TIME 135.0E 6506 WAKKANAI 135.0E

JUNE 1965

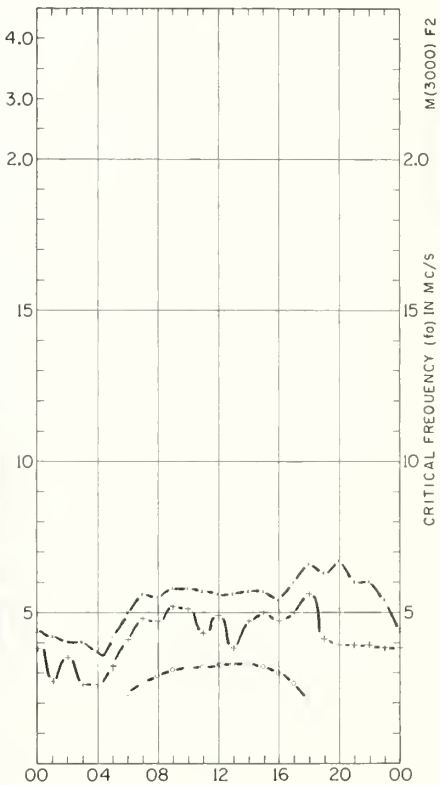
		CORRECTION																												
CHAR.	HR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
foF2	MED	51	50	46	44	F	44	50	55	56	55	52	53	52	52	52	53	51	52	54	56	63	U S	68	67	62	58			
	CNT	19	20	15	18		22	25	26	25	23	20	19	20	20	24	22	22	26	26	23	25	23	21	16	16				
	U Q	58	53	49	47		47	54	58	58	60	58	56	55	54	54	55	54	55	55	59	66	69	68	64	60				
	00	L Q	46	46	44	43		41	48	49	51	52	48	50	50	50	51	50	50	50	54	58	63	60	60	53				
foF1	MED						260	330	380	400	U A	420	430	430	440	U A	440	440	430	420	410	380	340	270						
	CNT						13	22	18	16		14	14	15	19		19	21	19	19	16	13	10	3						
	10																													
foE	MED	120	E	S	E	E	E															E	S	E	S	E	S			
	20	CNT	1	1	1	1	16															150	120	160	140					
foEs	MED	28	25	22	19		21	32	38	50	J	54	50	58	54	43	43	43	44	50	49	53	40	J	36	33	32	25		
	CNT	30	30	30	30		29	28	28	28		28	28	29	29	29	29	30	28	30	28	30	30	30	30	30	30			
	U Q	43	34	33	31		38	35	52	60		64	70	73	70	62	57	63	65	73	78	81	51	51	51	50	43			
	30	L Q	18	18	13	13	F		27	36	42	U A	46	44	43	44	40	38	39	35	40	37	41	32	30	26	21	18		
M 3000 F2	MED	300	295	300	300		300	310	310	320		320	320	310	310		300	290	300	300	300	310	305	305	310	300	300	305		
	CNT	19	20	15	18		22	26	26	25		24	20	19	20		20	24	22	22	26	26	23	25	23	21	16	16		
h'F2	MED						305	300	310	310		310	320	360	370		380	410	375	370	365	330	310	280						
	CNT						13	23	24	22		21	19	19	18		17	24	19	22	20	22	18	12						
h'E	04																													
	24																													
h'F	MED	260	280	275	270		260	250	245	240		235	220	225	210		220	220	225	240	U A	245	250	250	265	U A	260	255	255	255
	CNT	30	29	29	29		28	22	14	9		9	12	15	17		19	20	19	18	U A	14	13	13	15	U A	23	25	26	29
16 CHAR	HR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					

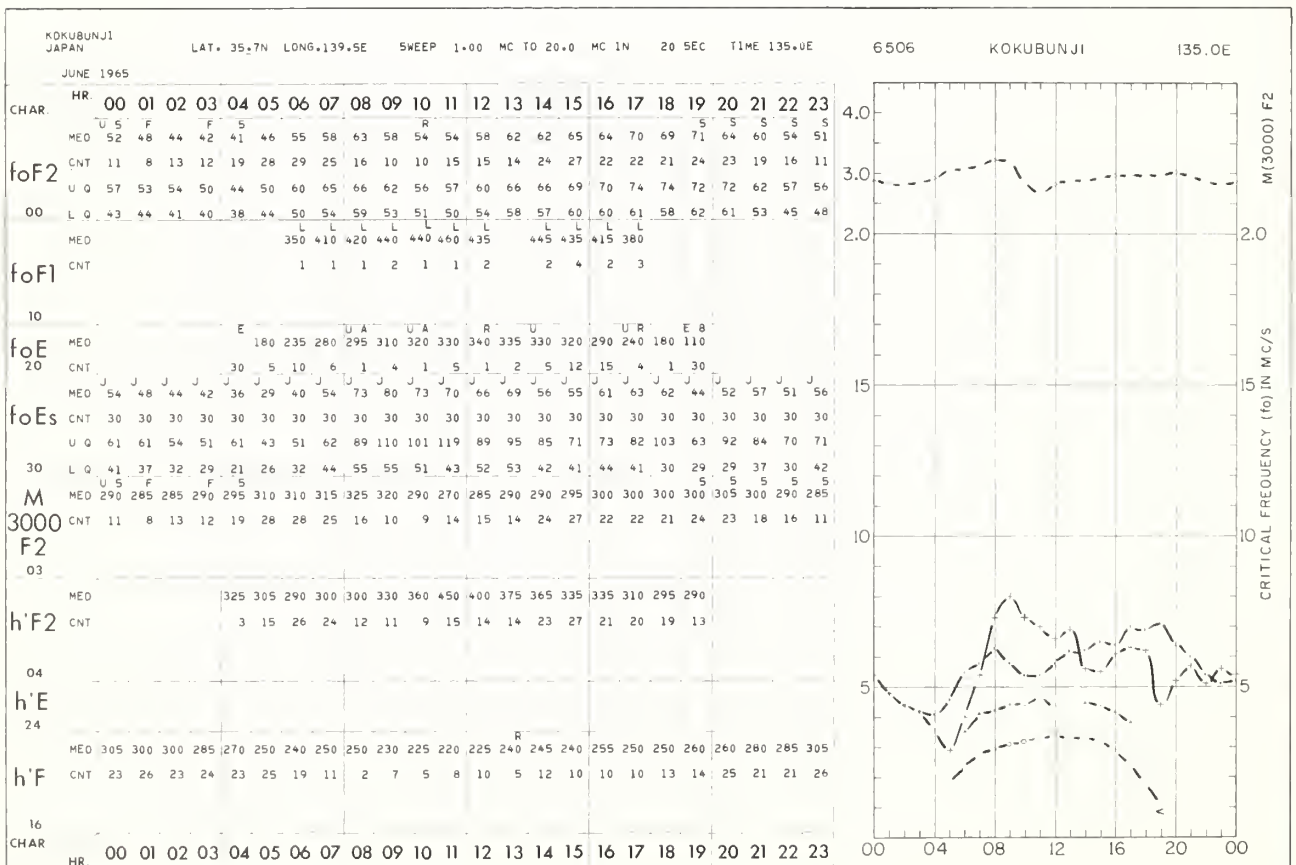
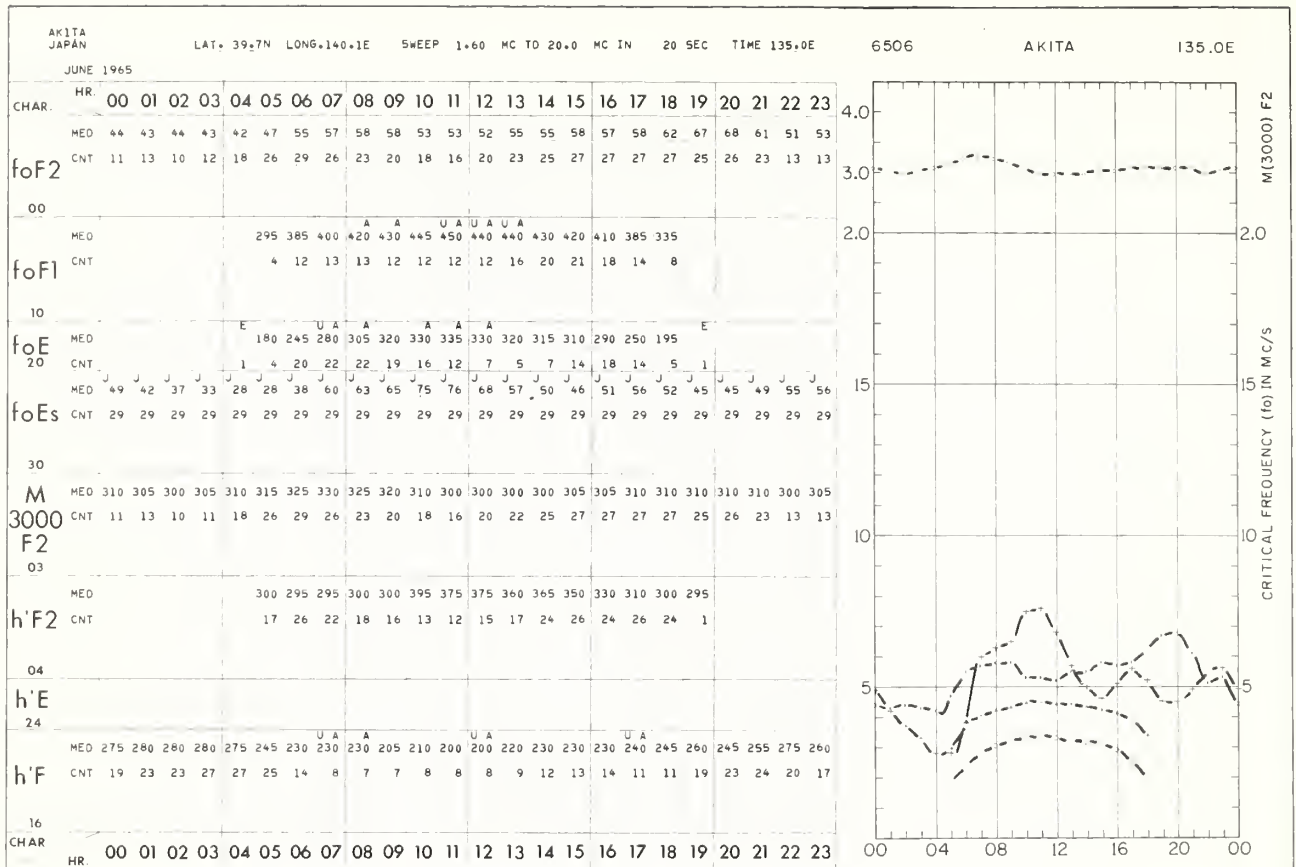


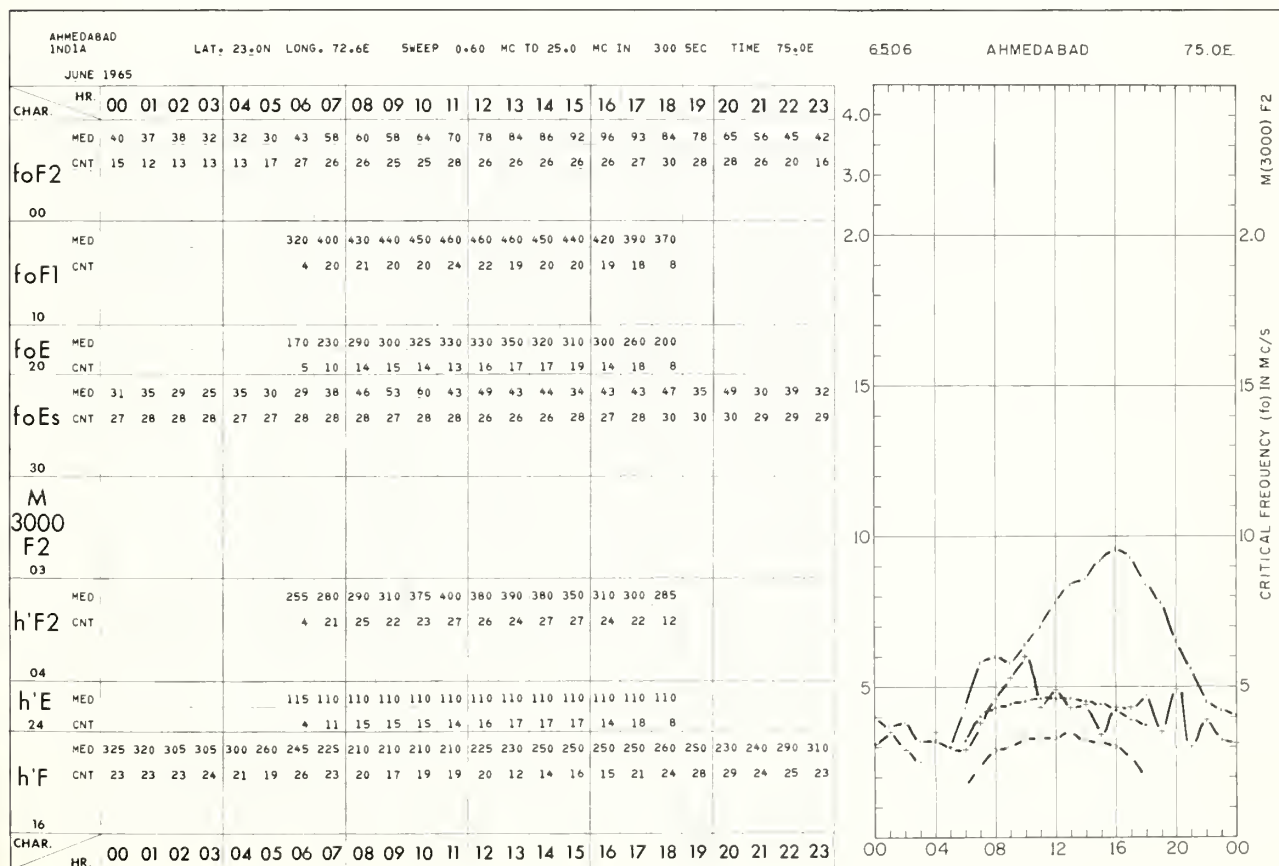
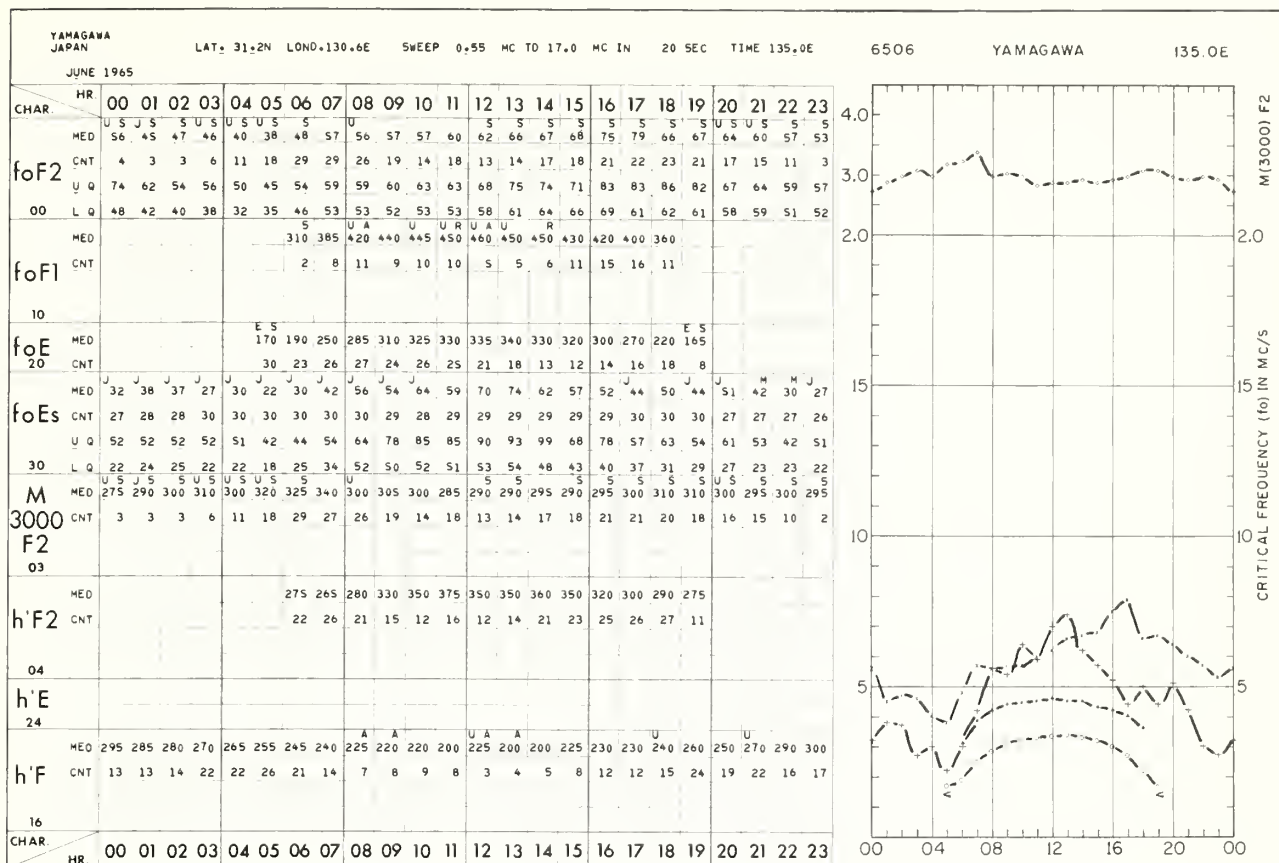
TORTOSA SPAIN LAT. 40.8N LONG. 0.0 SWEEP 1.40 MC TO 16.6 MC IN 60 SEC TIME 0.0 6506 TORTOSA 0.0

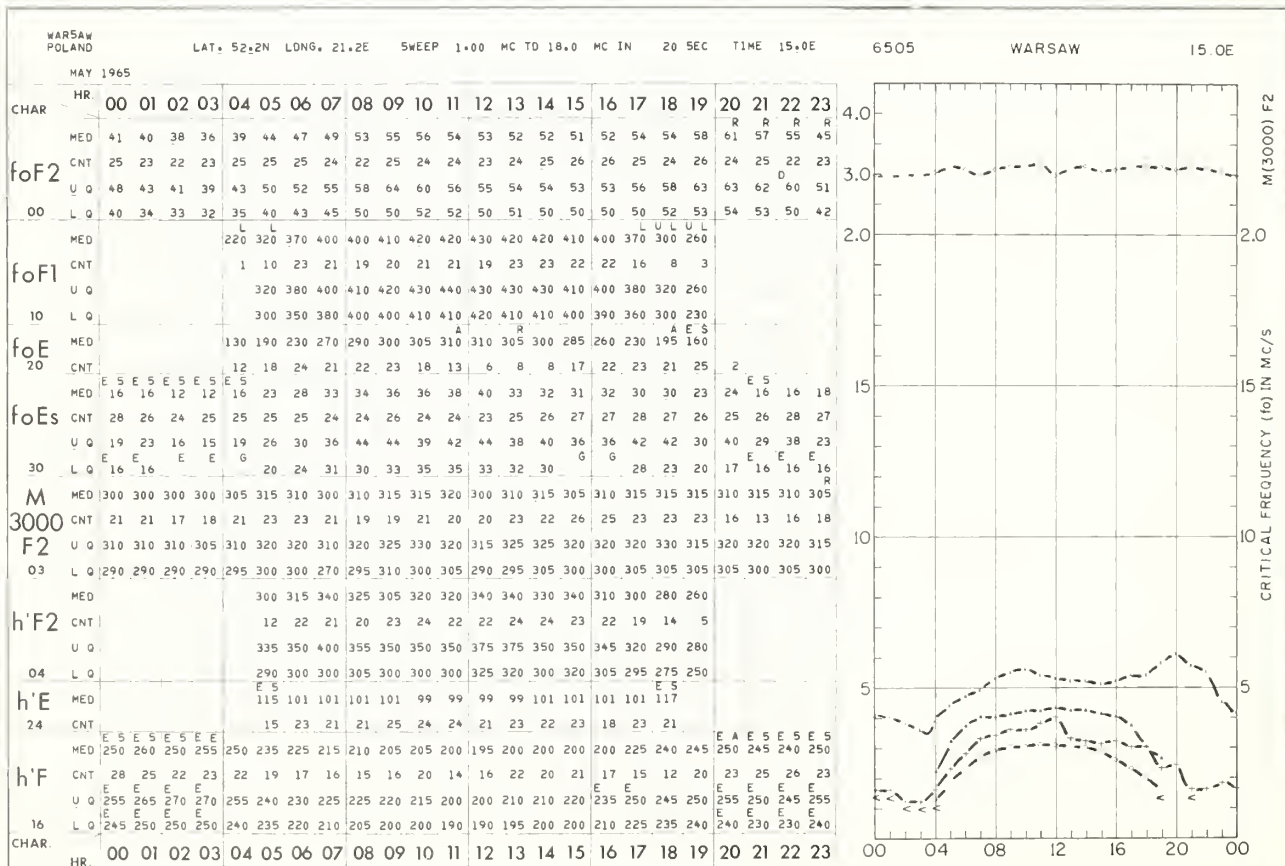
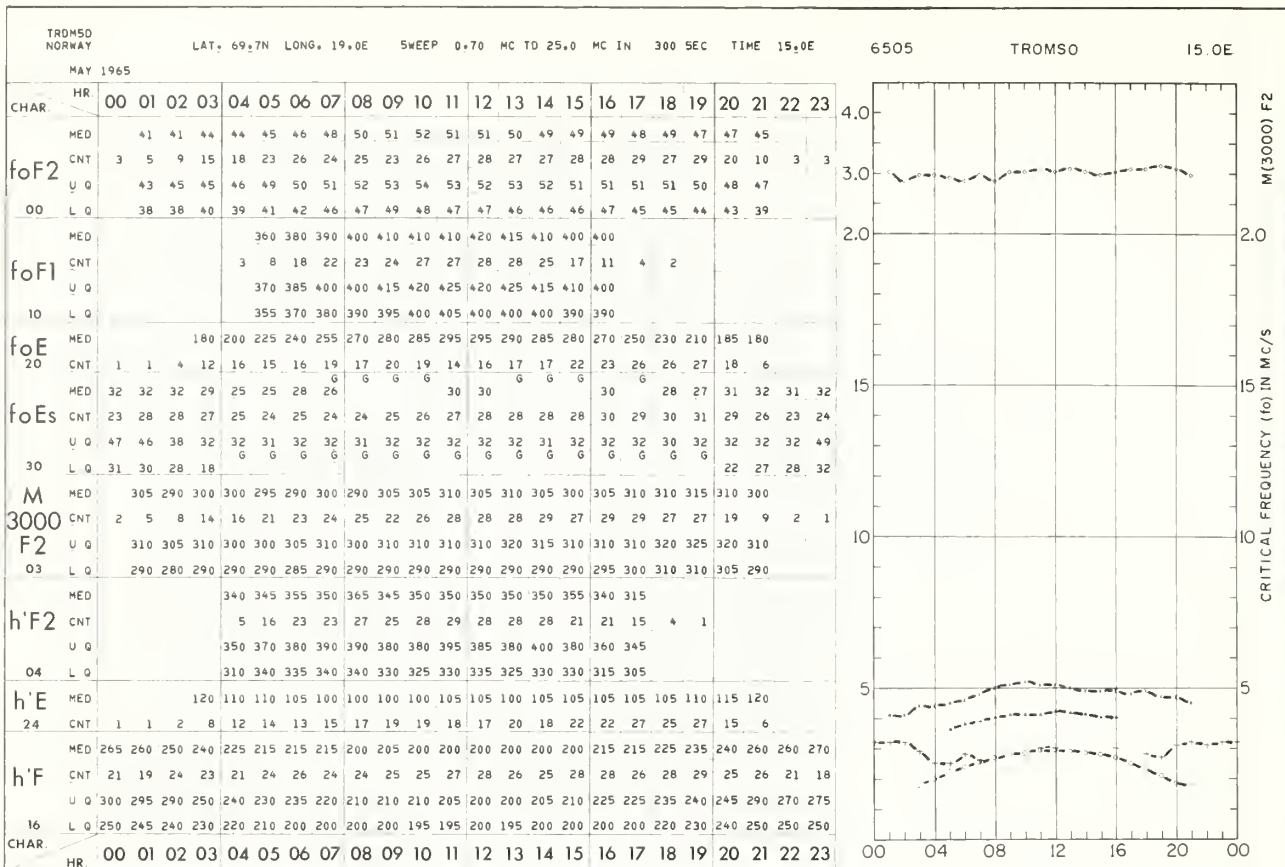
JUNE 1965

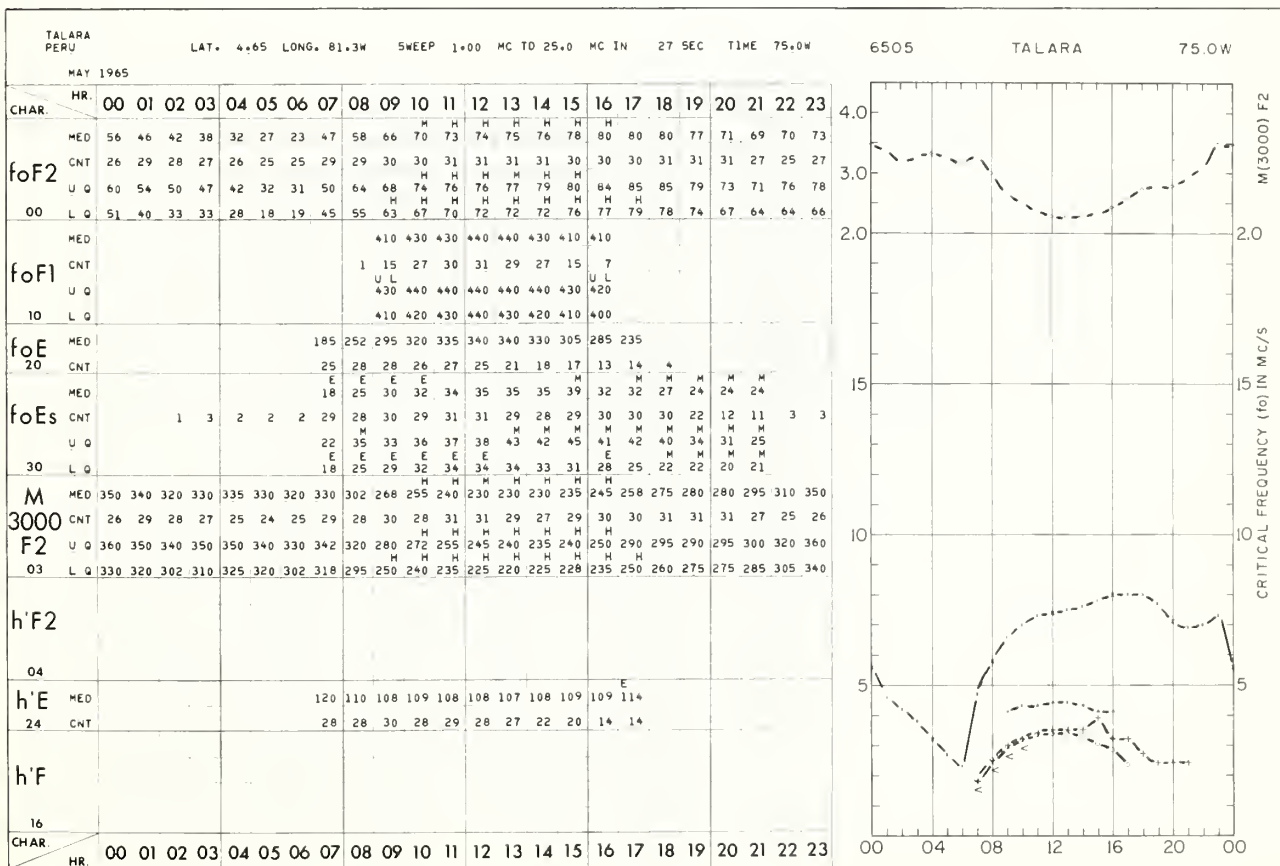
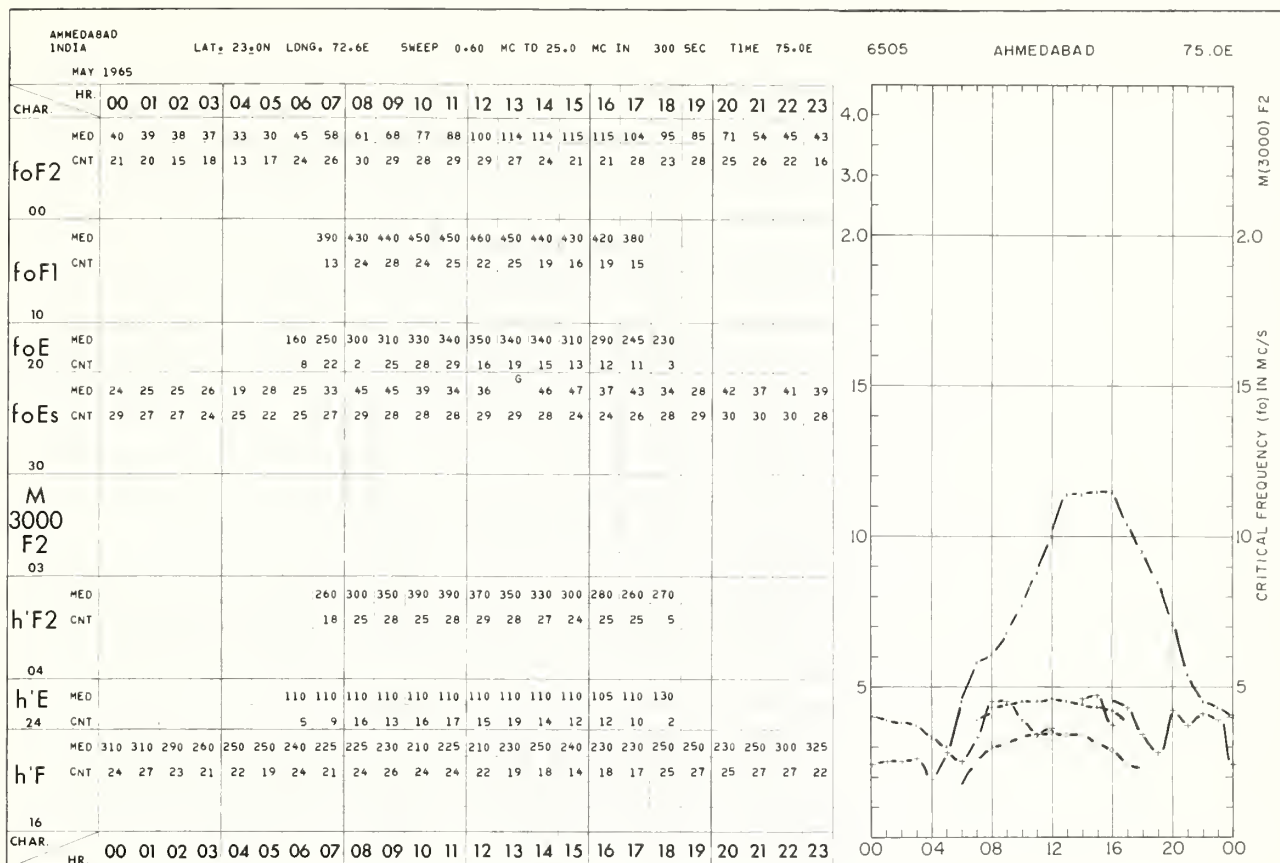
CHAR	HR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
foF2	MED	44	42	40	40	37	42	50	56	55	58	58	57	56	56	57	57	54	60	66	63	67	60	60	54
	CNT	8	9	10	10	11	13	10	9	9	10	11	13	11	13	12	11	10	11	9	12	10	12	10	6
00																									
foF1																									
	10																								
foE20	MED					230	270	290	310	320	320	330	330	330	320	300	265	210							
	CNT					13	12	11	10	13	11	9	10	11	13	14	14	14							
foEs	MED	38	27	35	26	26	32	41	48	47	52	51	43	49	38	47	50	47	50	56	41	39	39	39	38
	CNT	13	13	13	13	13	13	13	12	11	10	13	13	12	13	12	14	13	14	14	14	14	14	14	13
30																									
M3000F203																									
	03																								
h'F2	MED					385	280	325	305	340	370	360	350	345	345	340	325	300							
	CNT					8	6	8	10	10	13	13	10	12	13	9	11	11	9						
04																									
h'E24	MED					115	102	100	100	100	100	100	100	100	100	100	100	104	119						
	CNT					13	12	11	10	13	11	9	10	11	13	14	14	14							
h'F	MED	225	280	280	280	275	225	230		200	210	200	200	225	225		235	250	200	220	235				
	CNT	7	8	10	8	12	12	6		6	10	7	9	7	5		11	10	11	9	6				
16																									
CHAR	HR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23

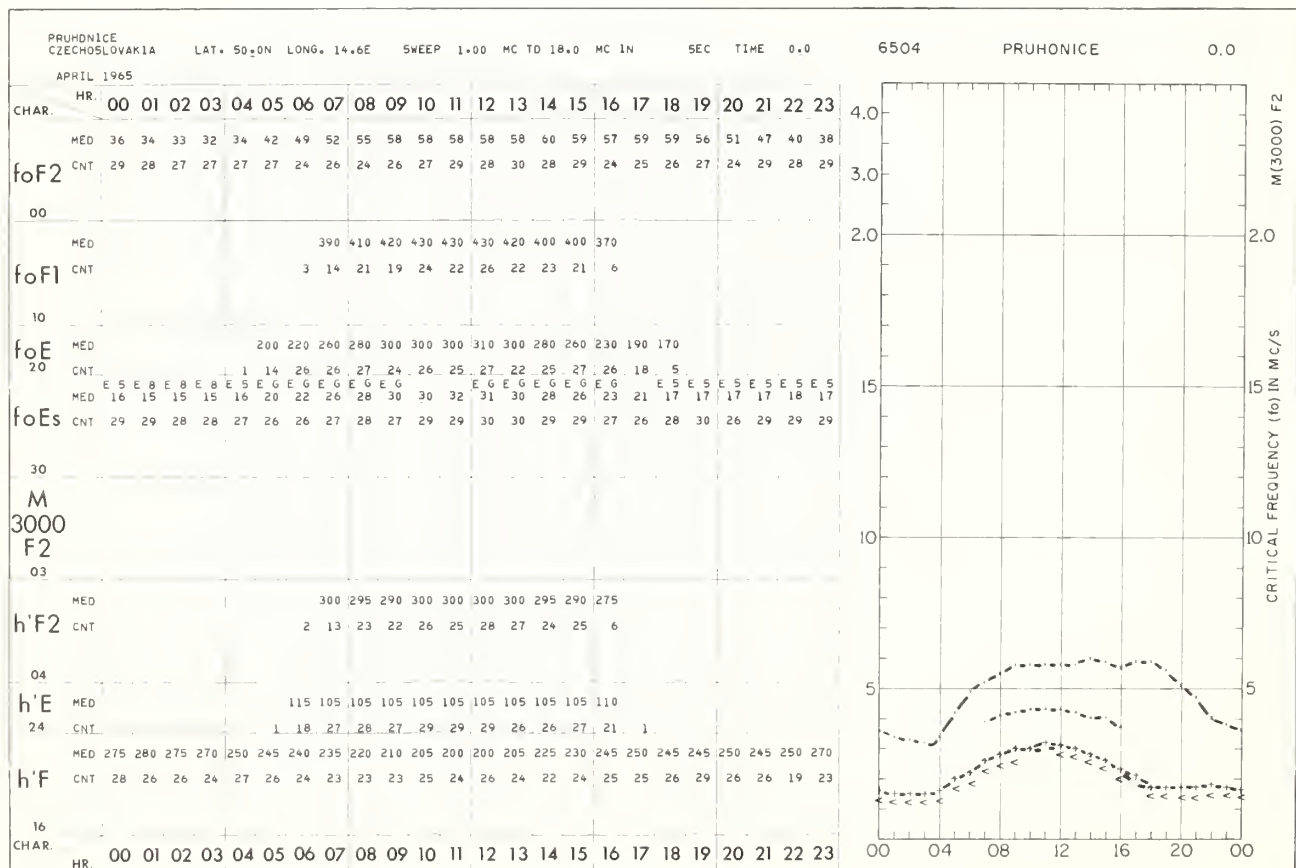
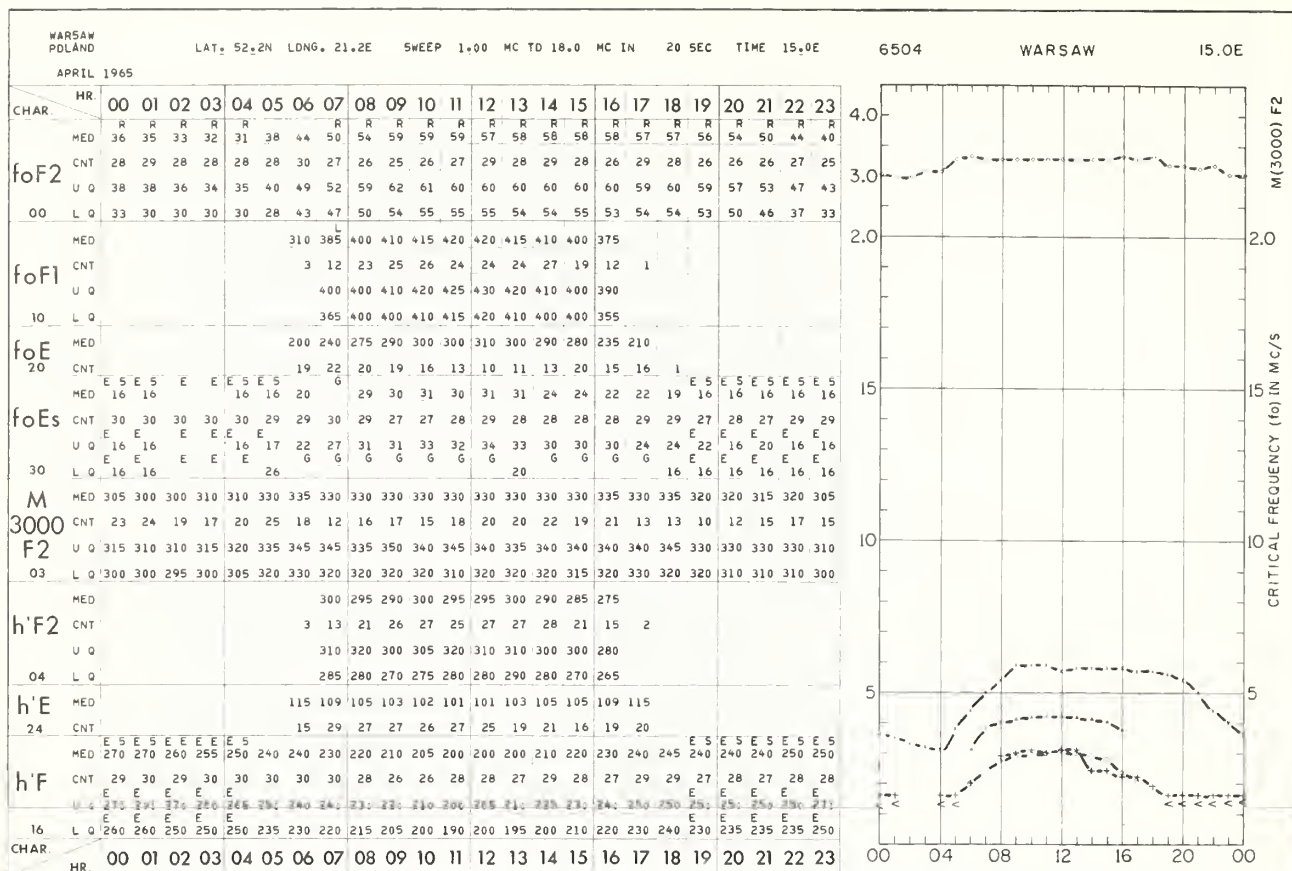


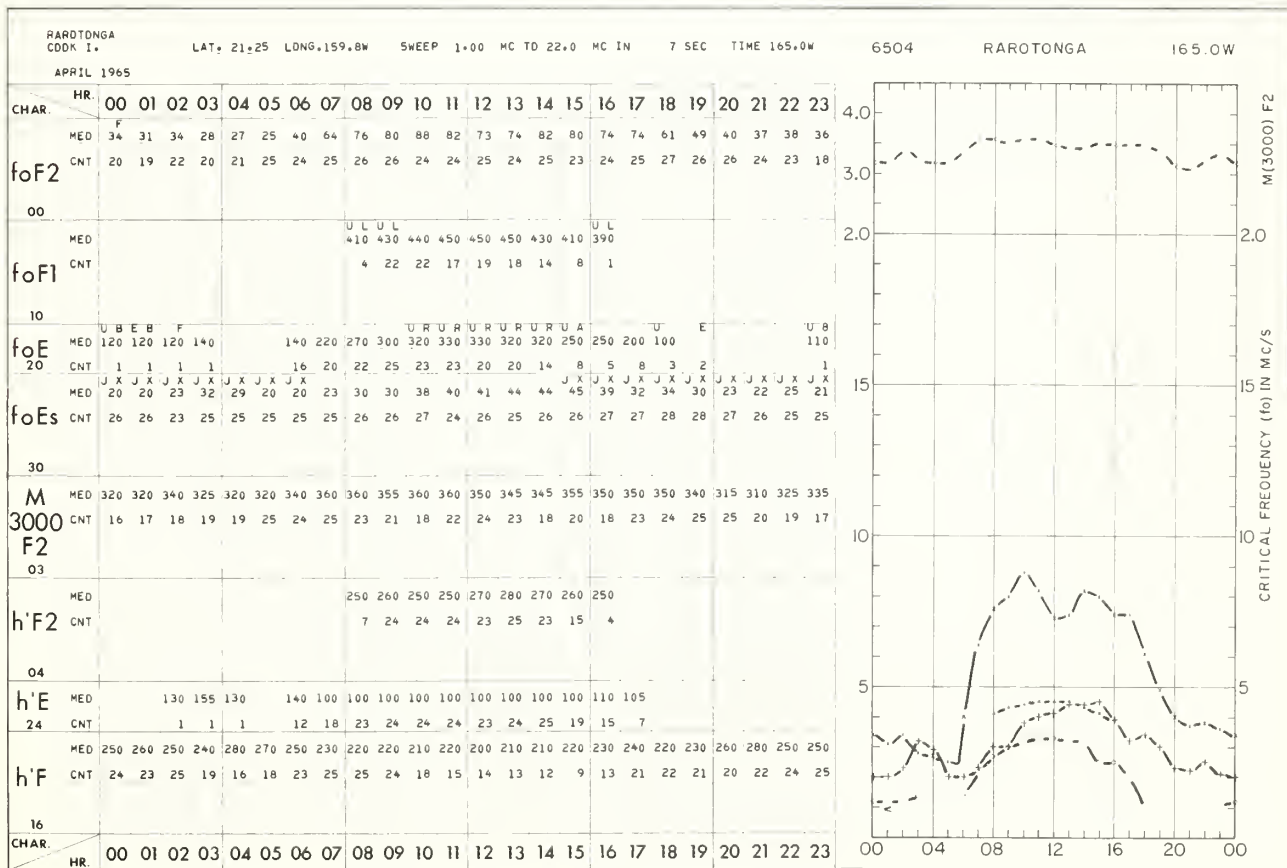
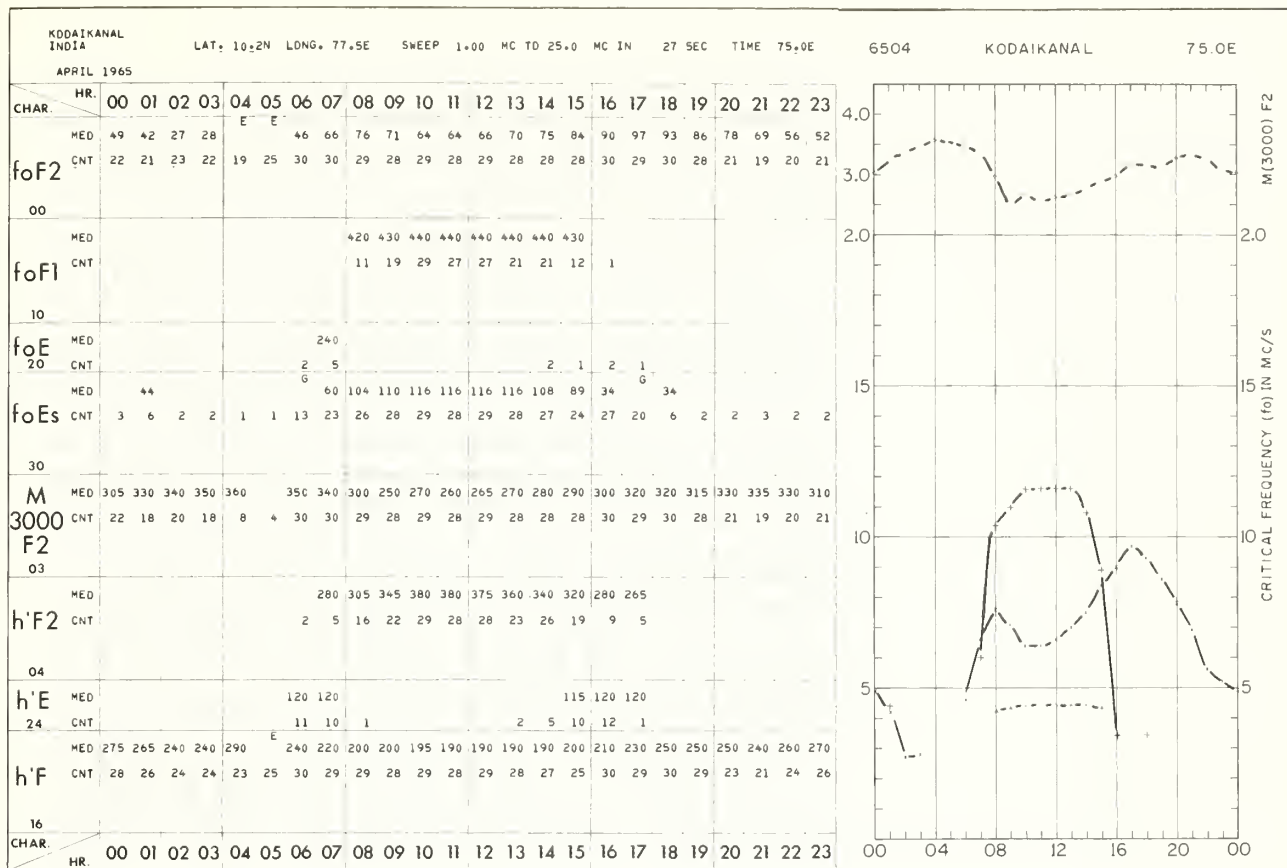


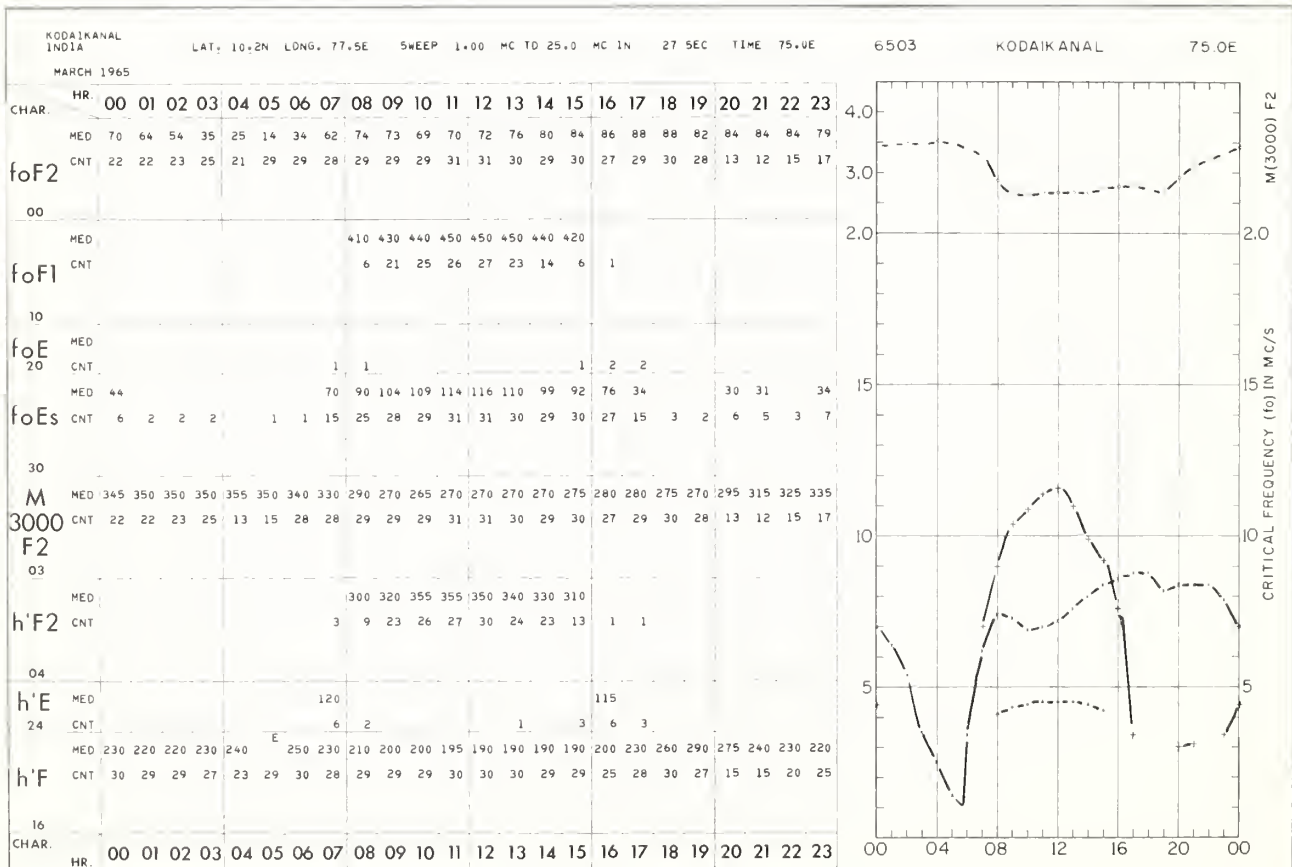
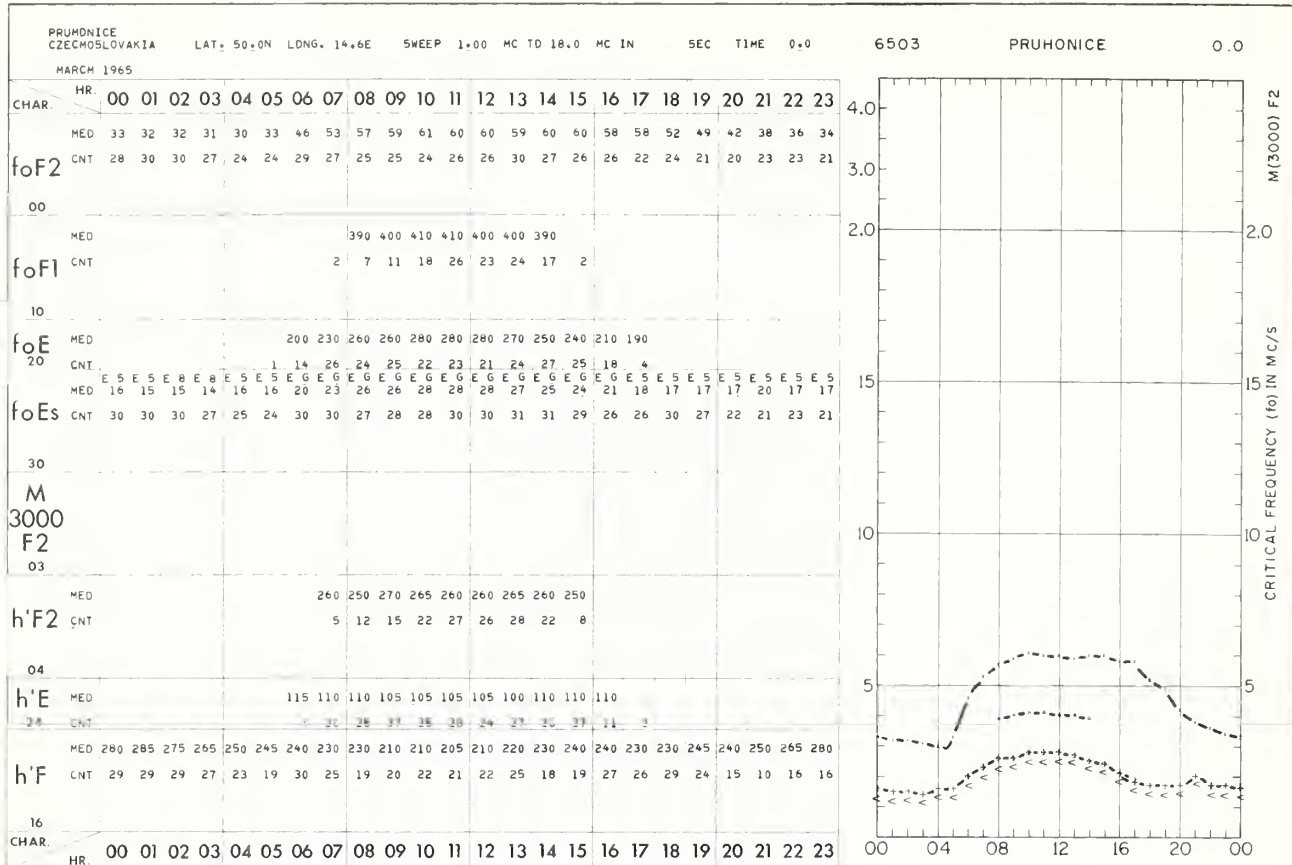


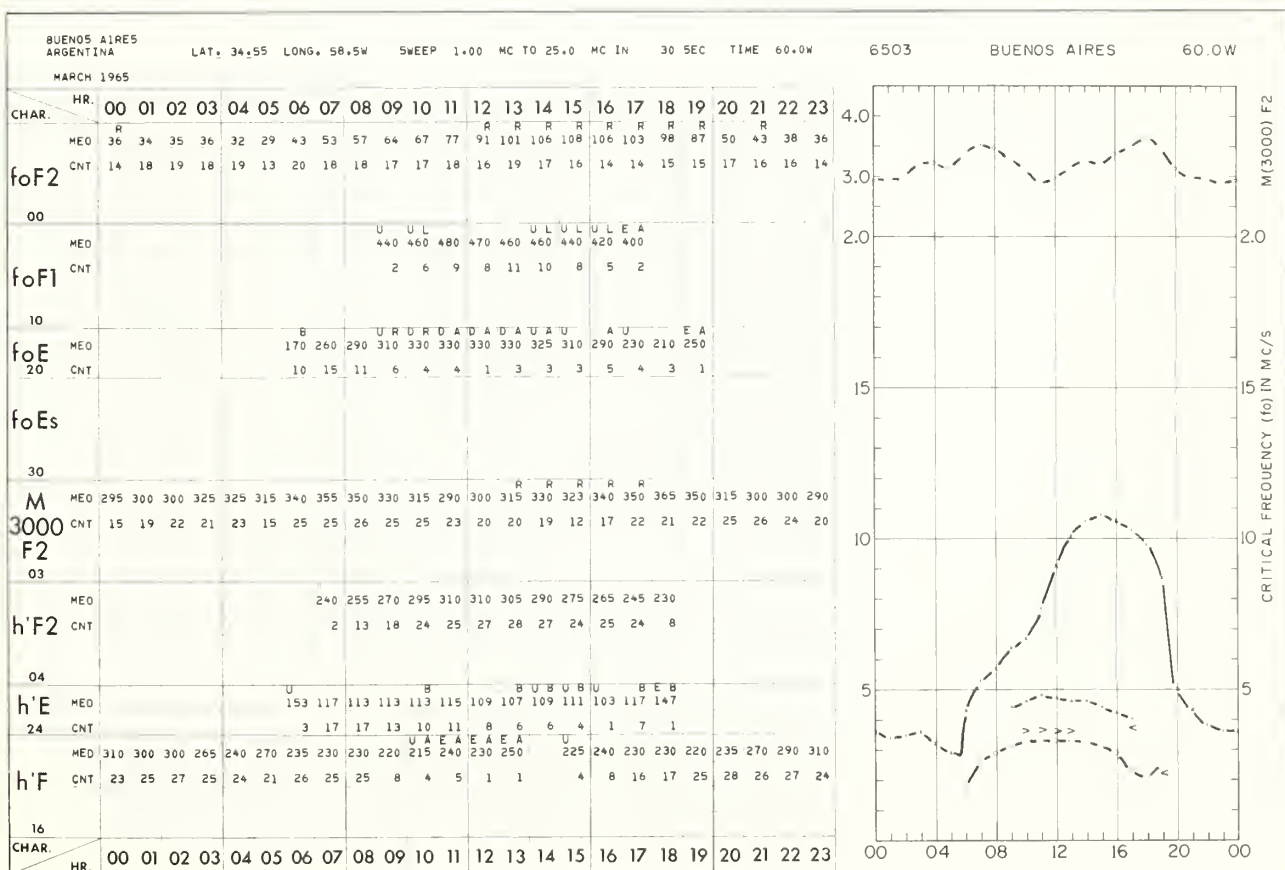
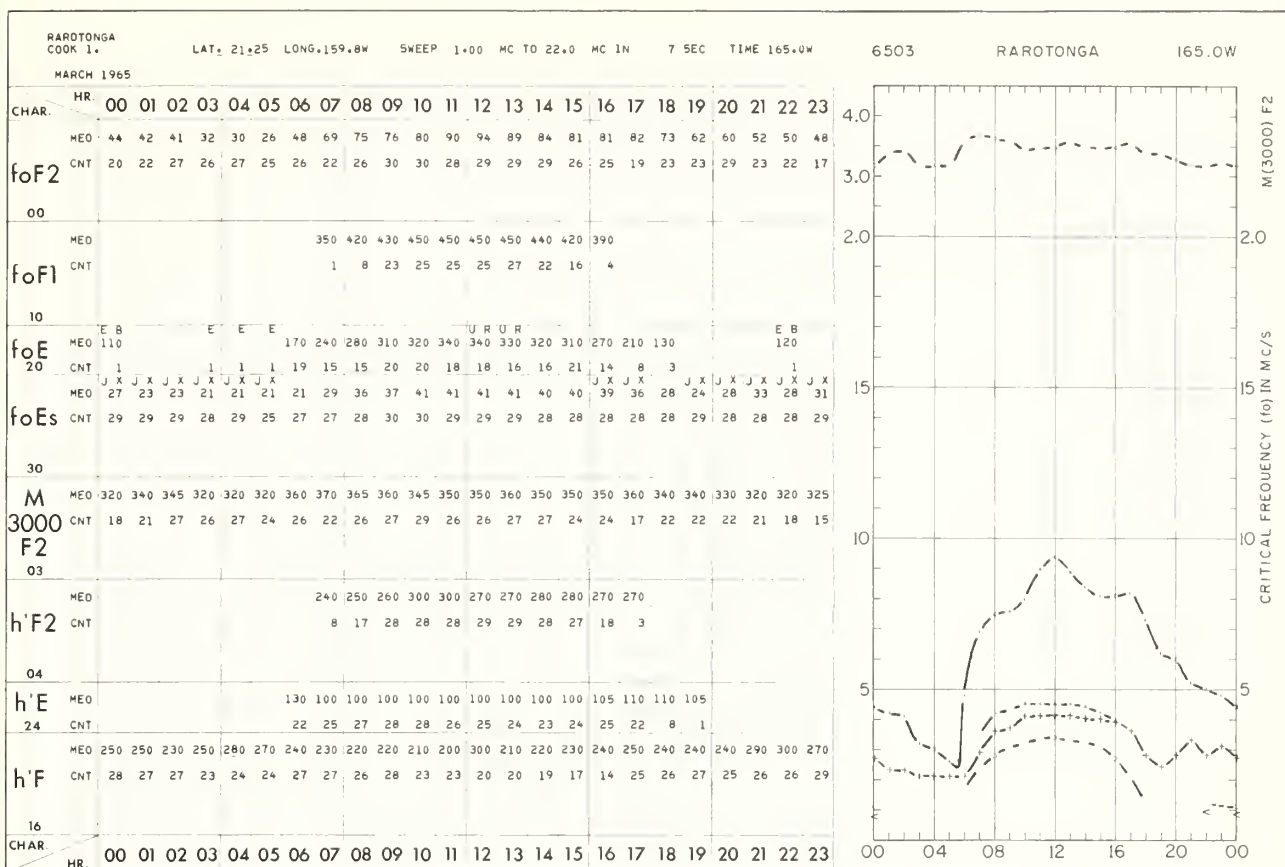


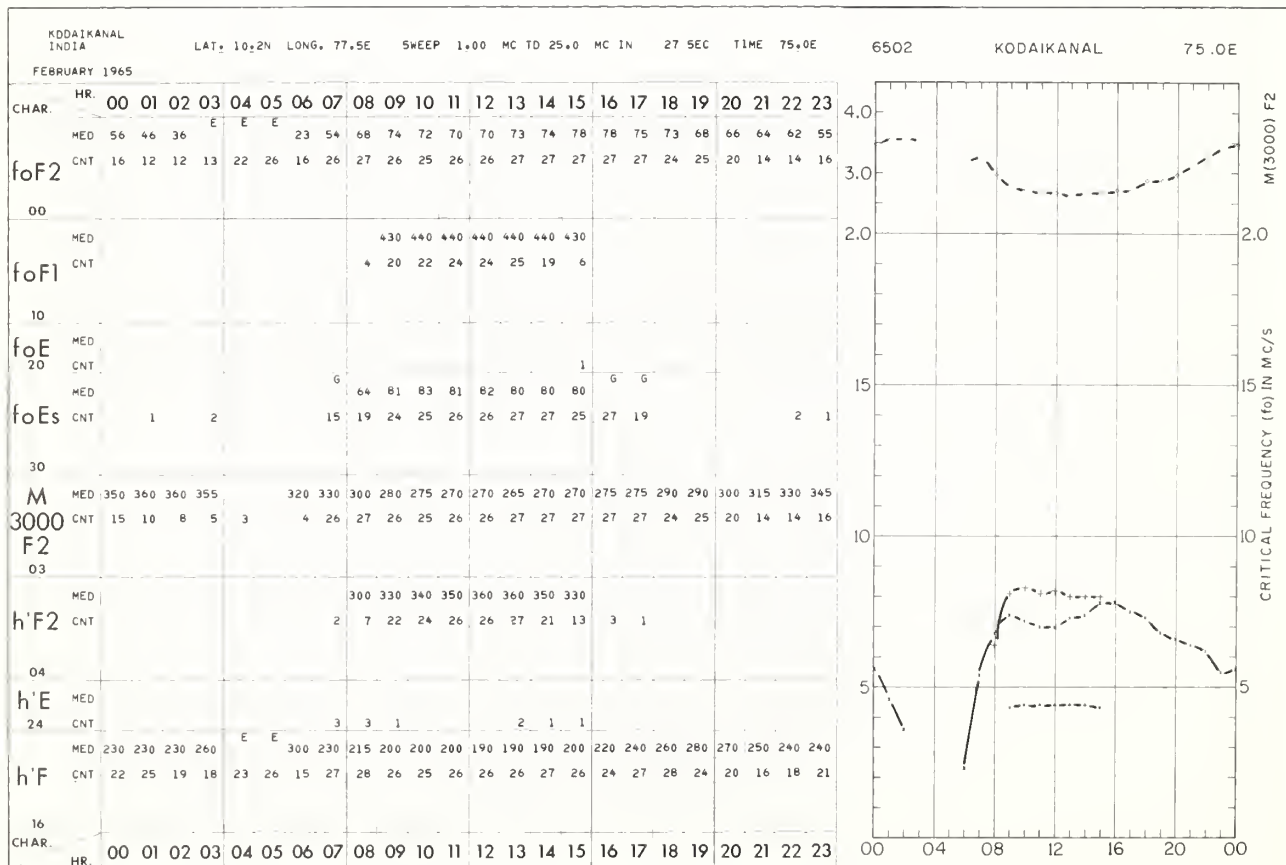
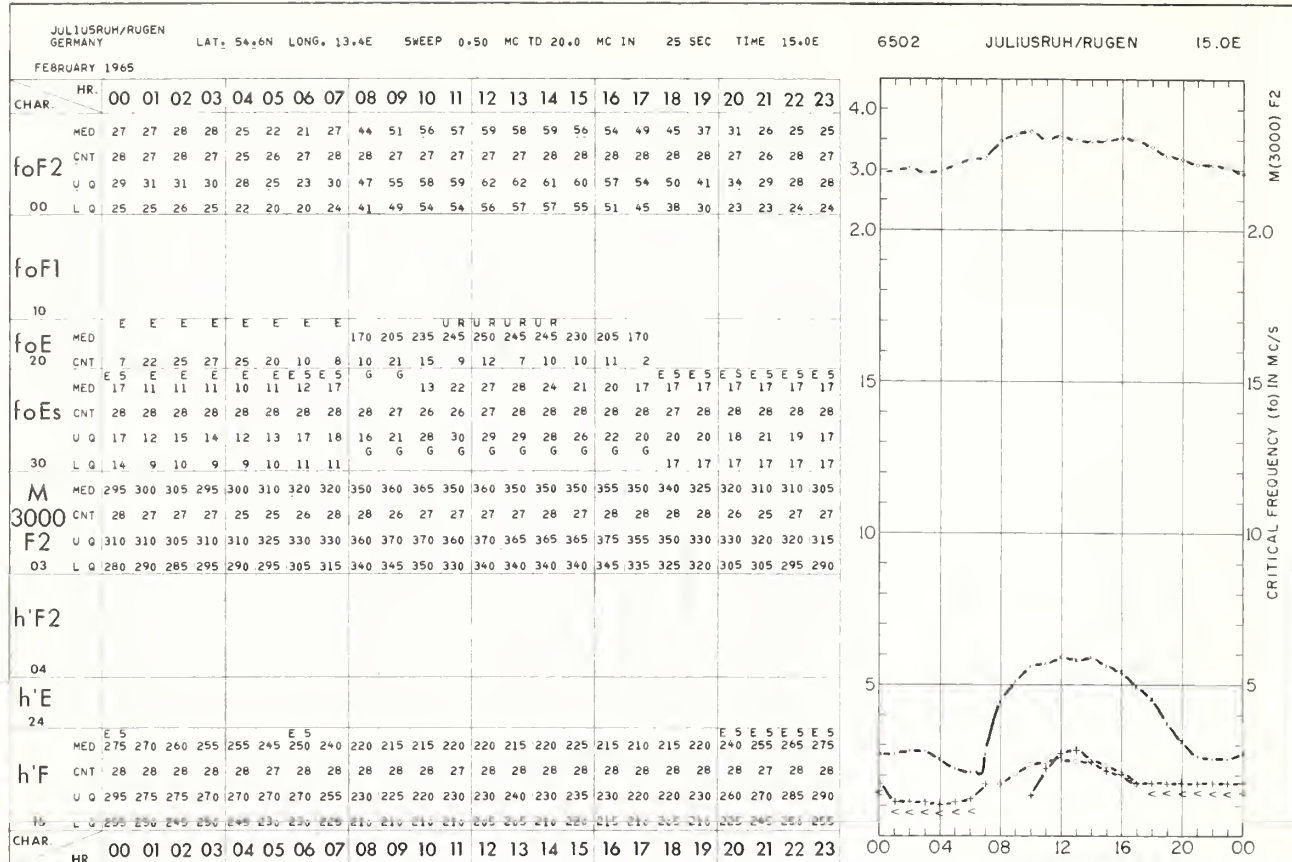


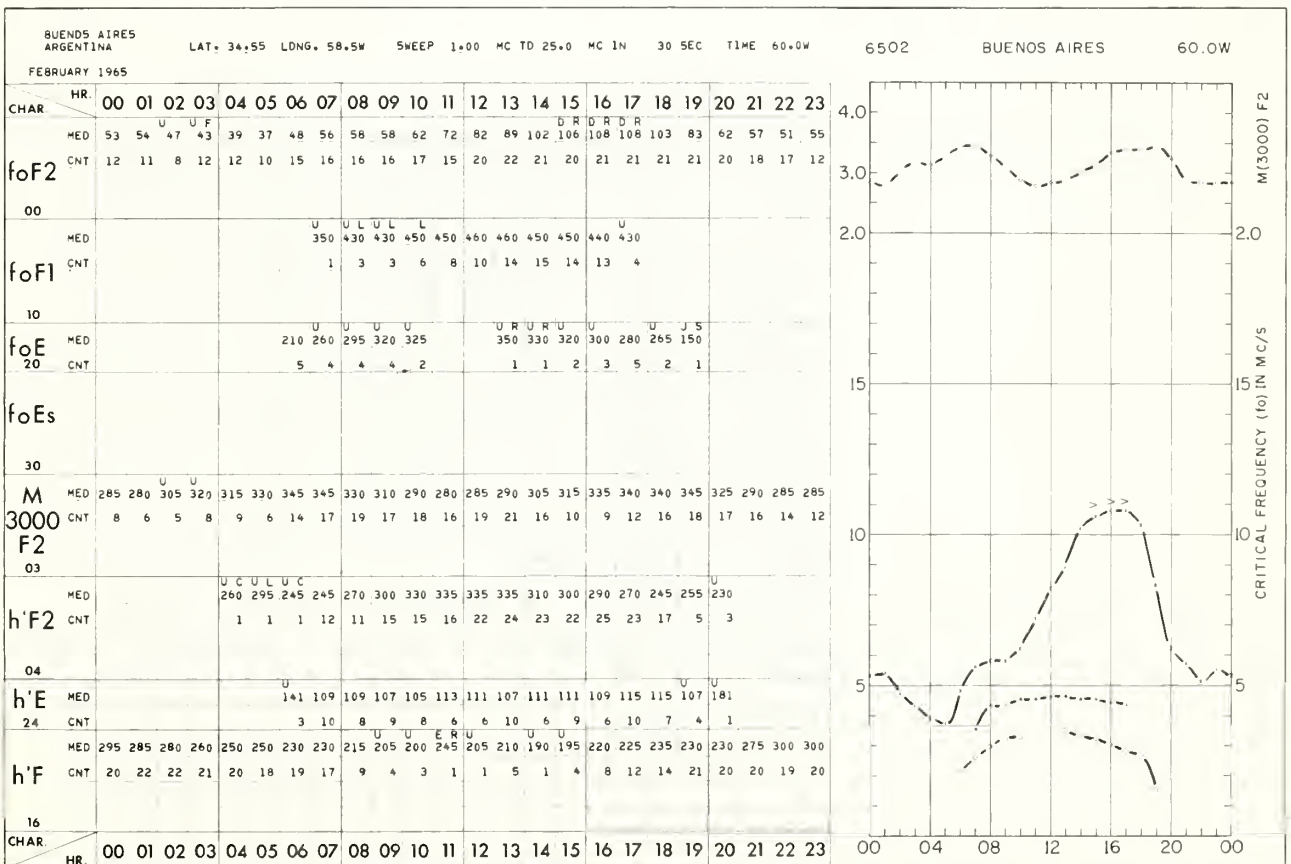
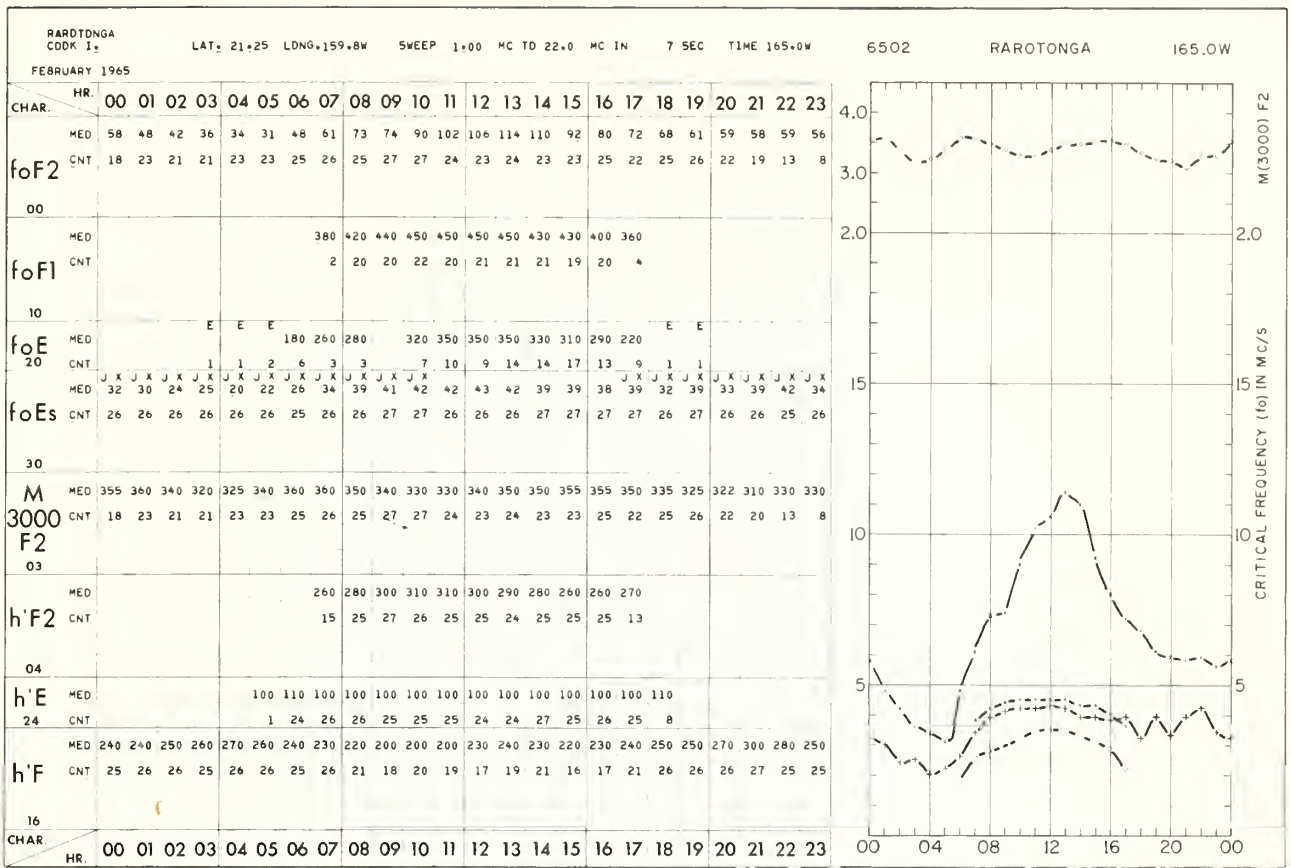


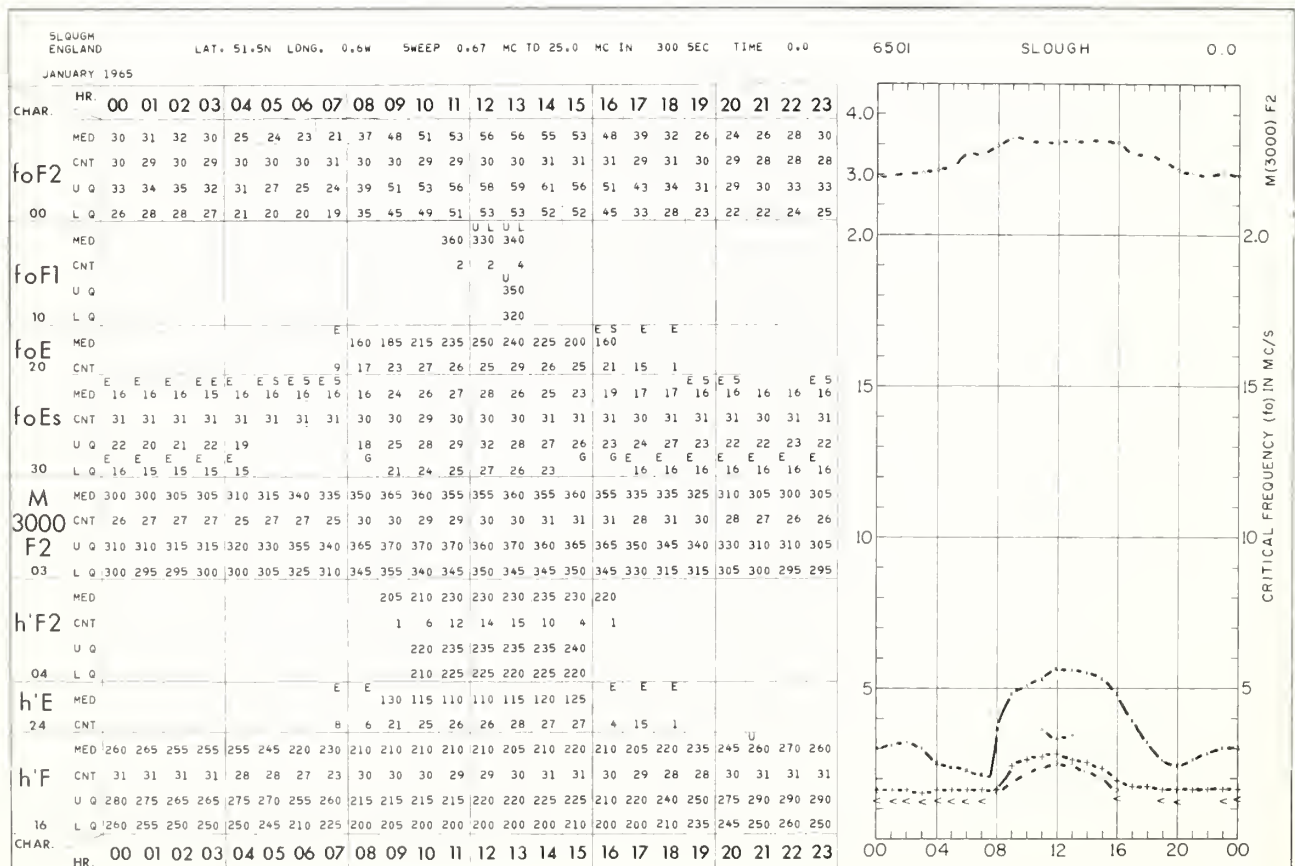


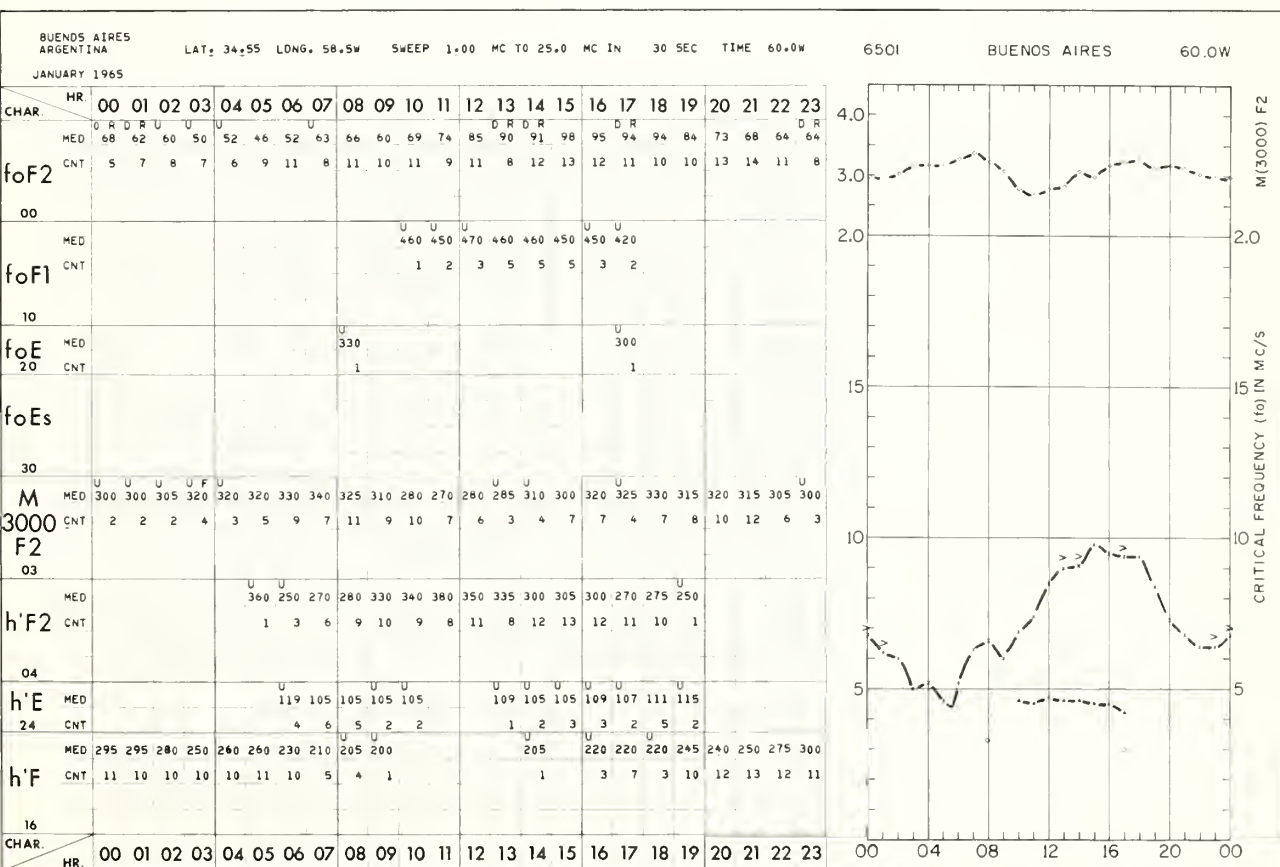
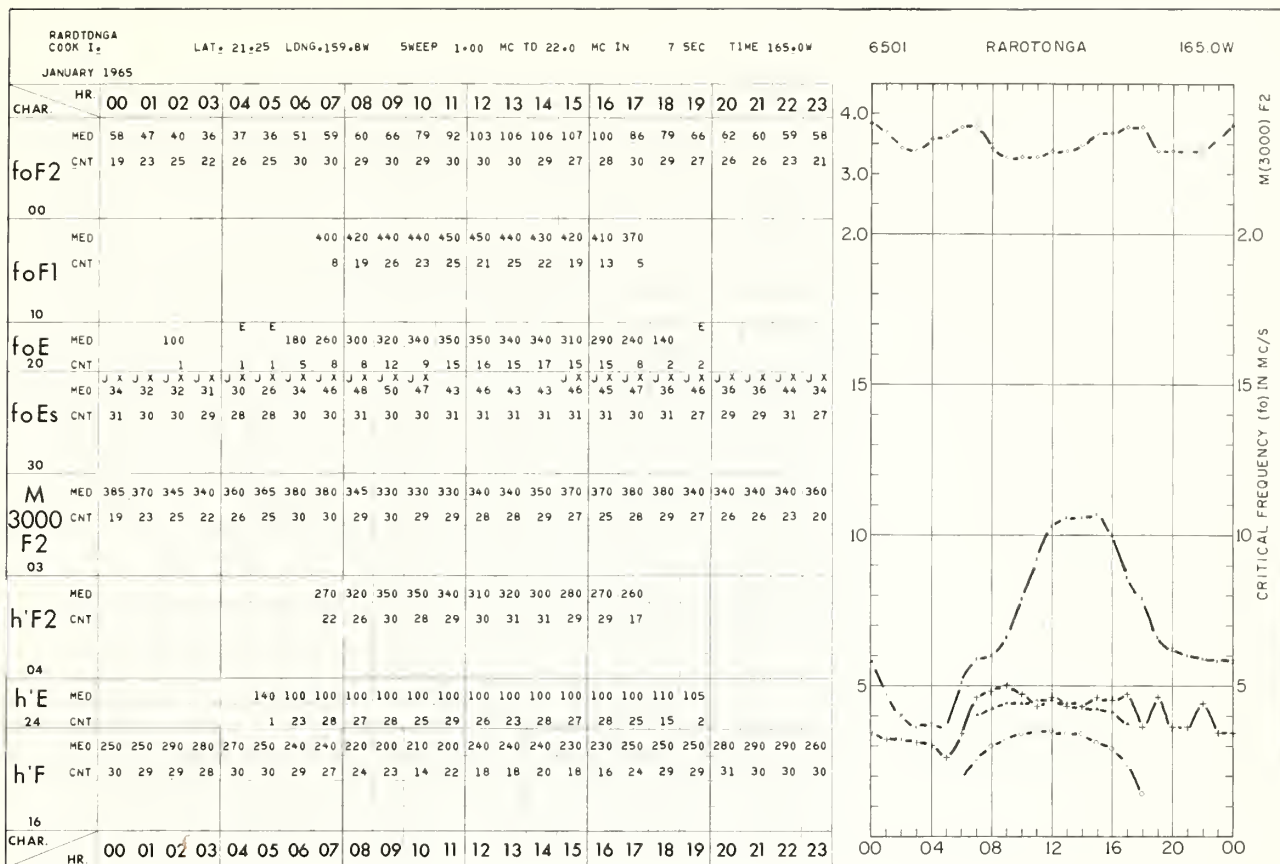


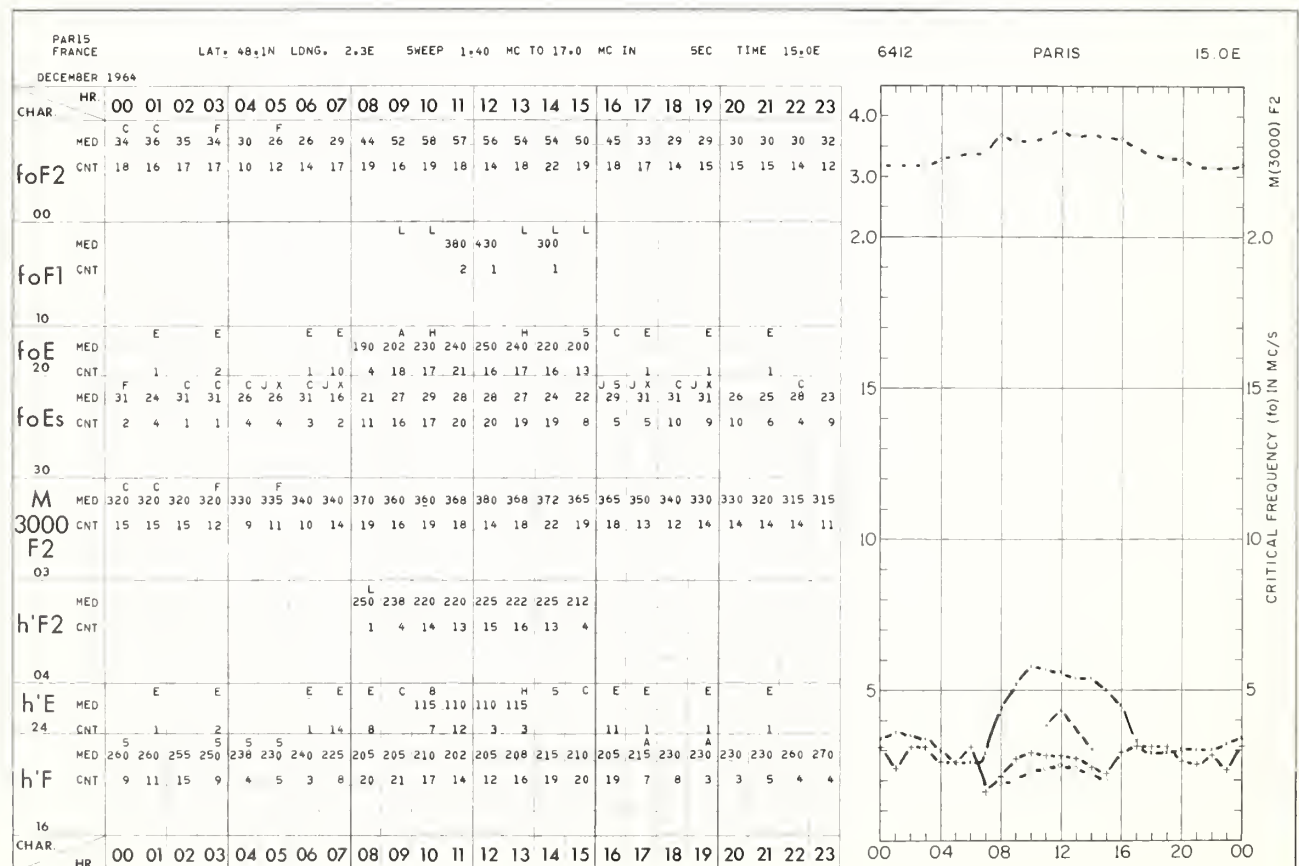
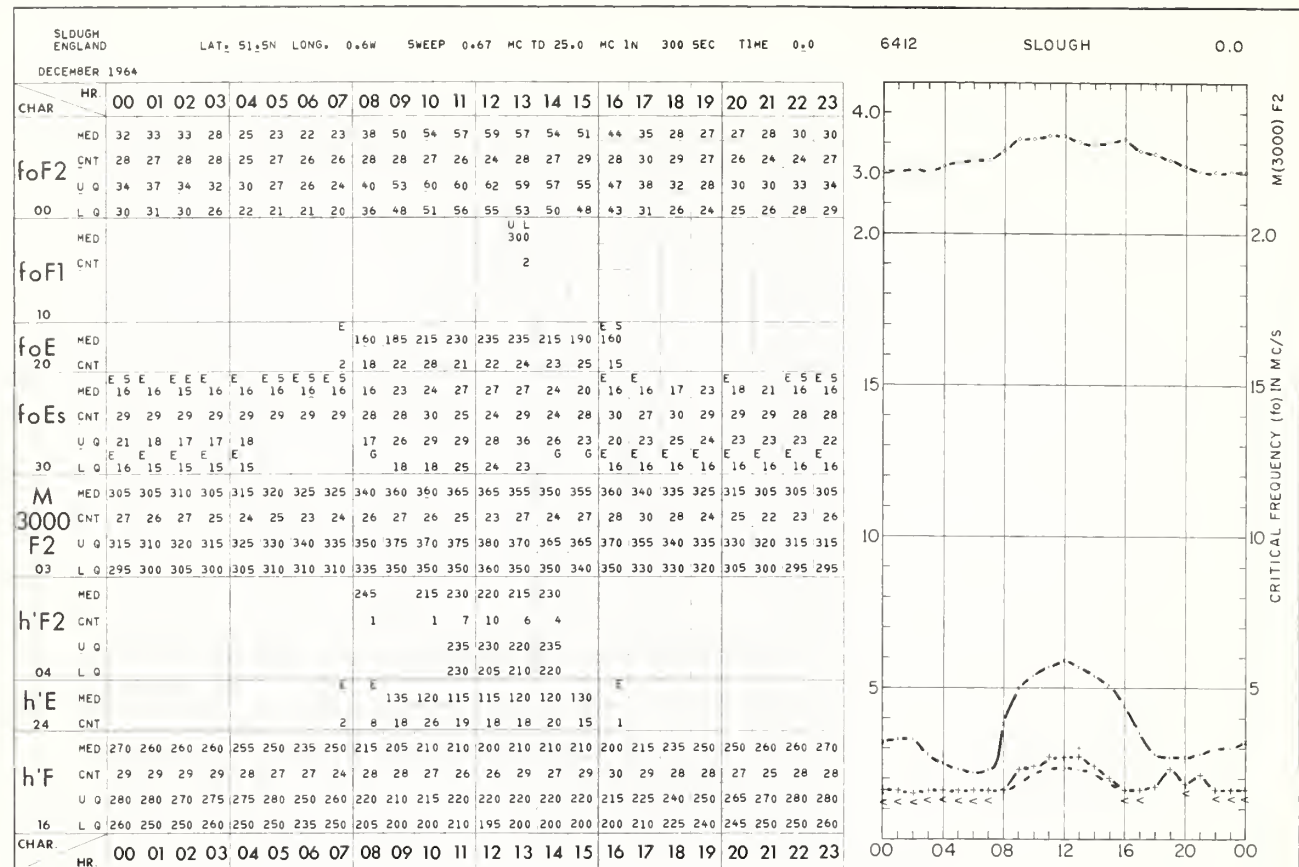


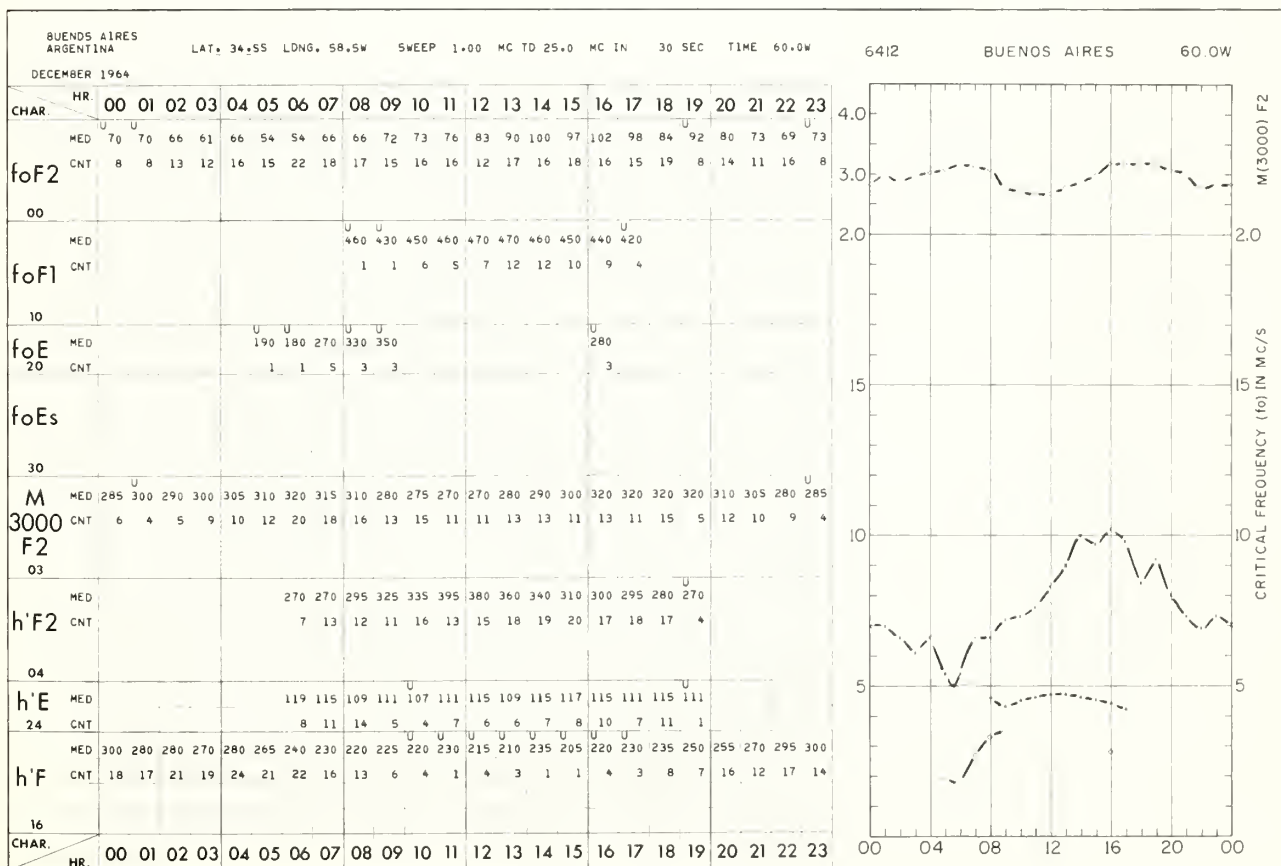
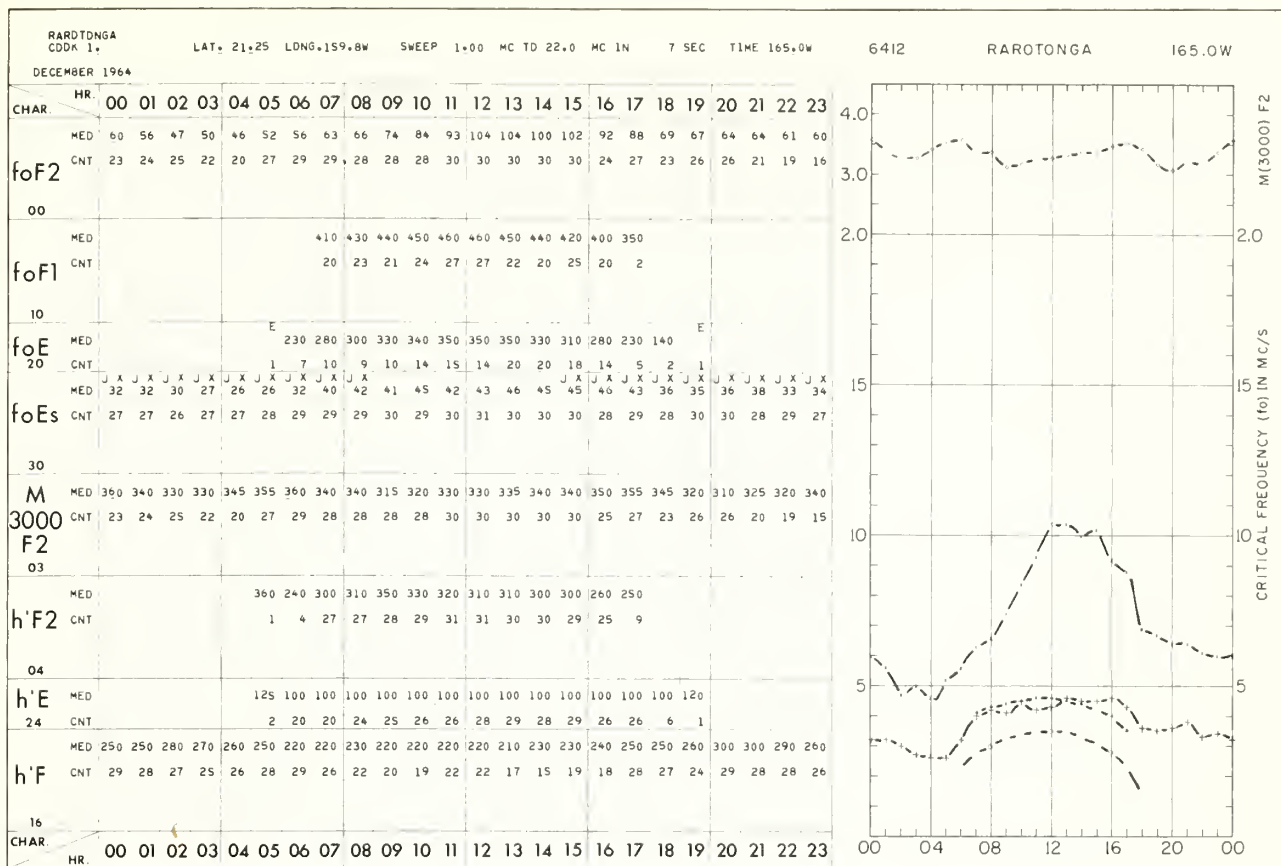


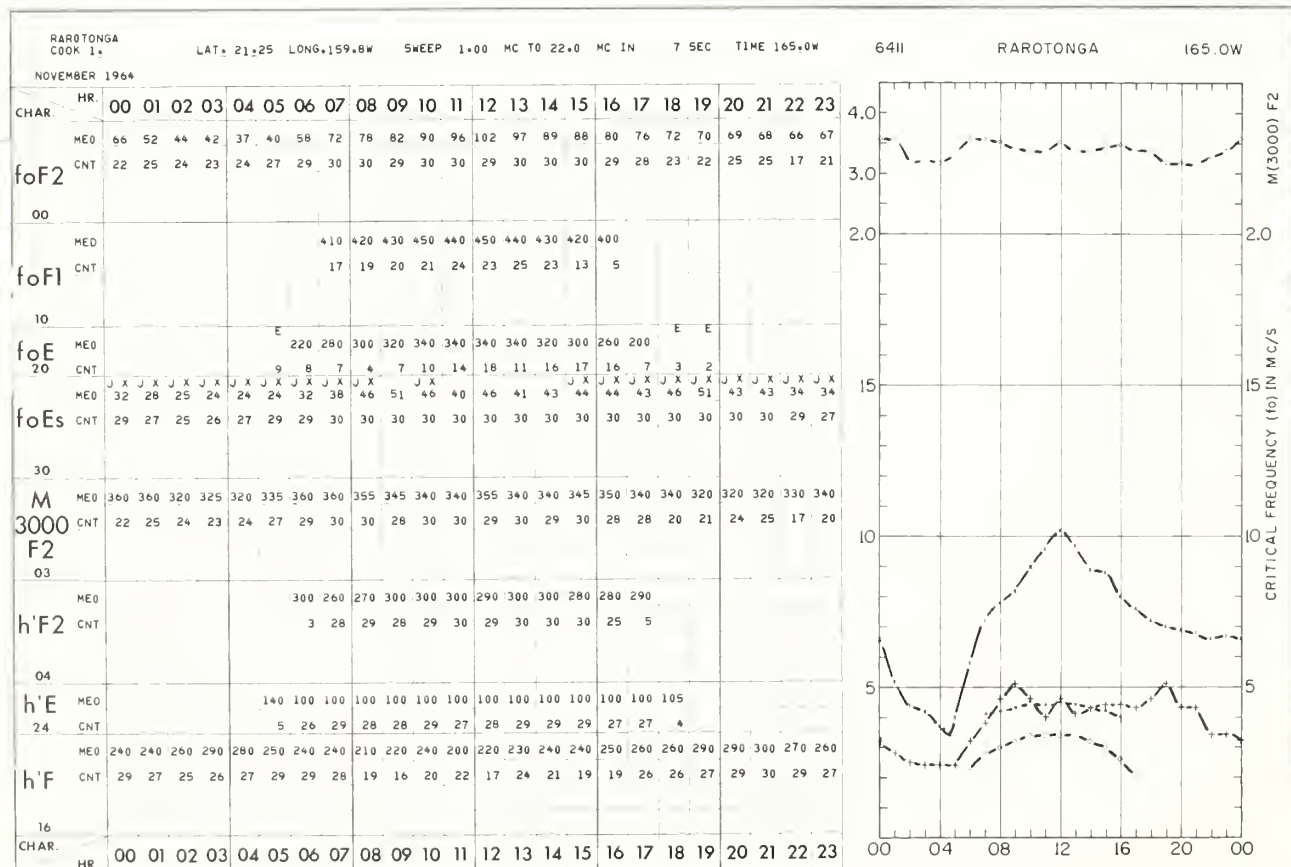
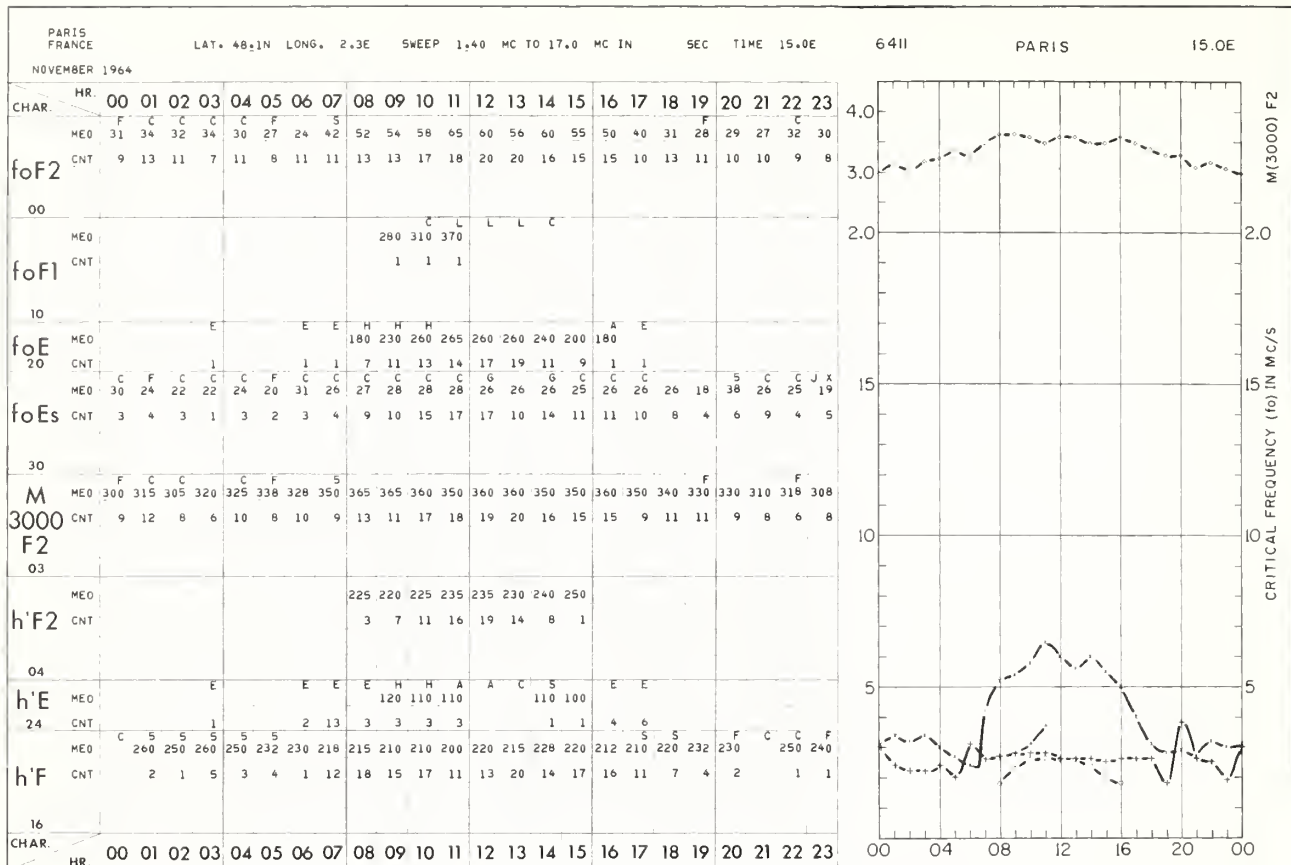


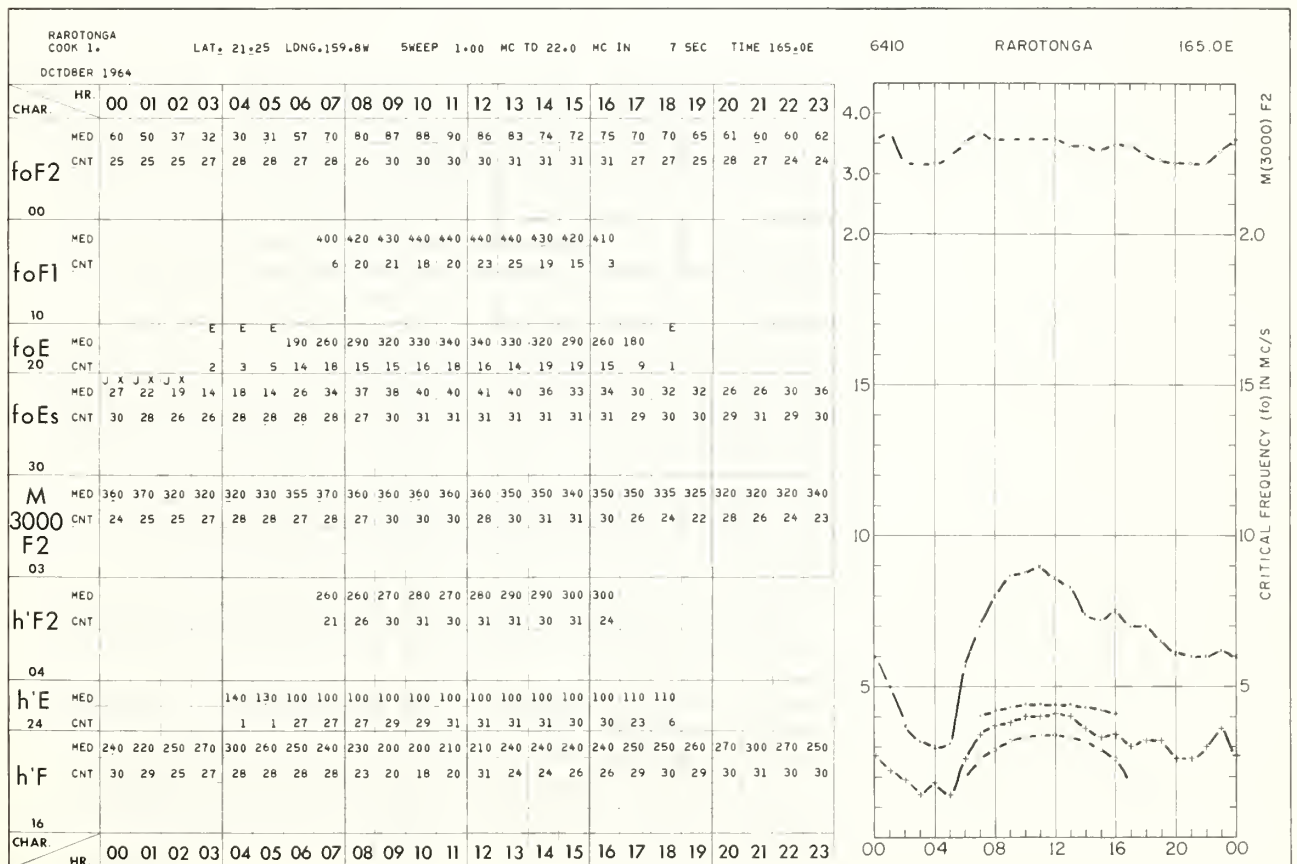
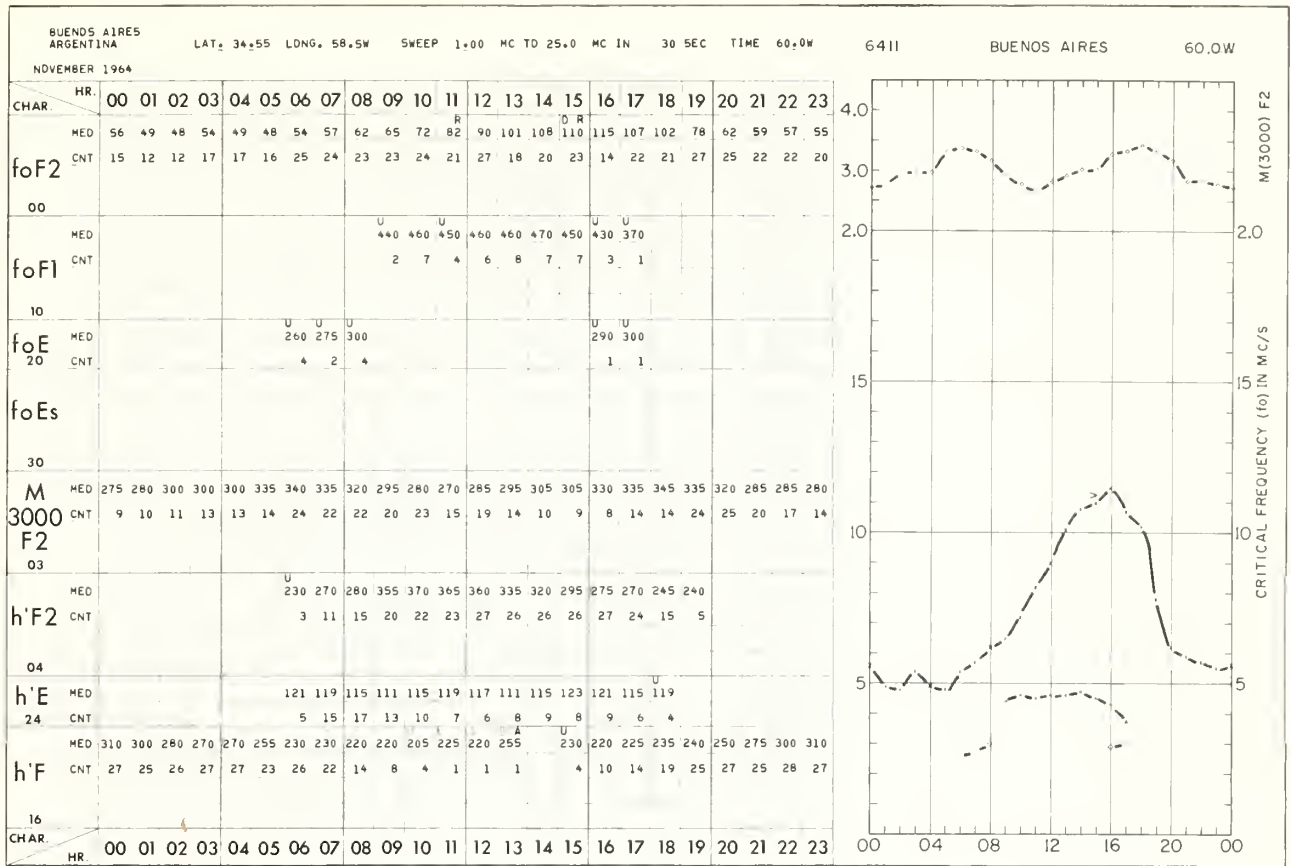


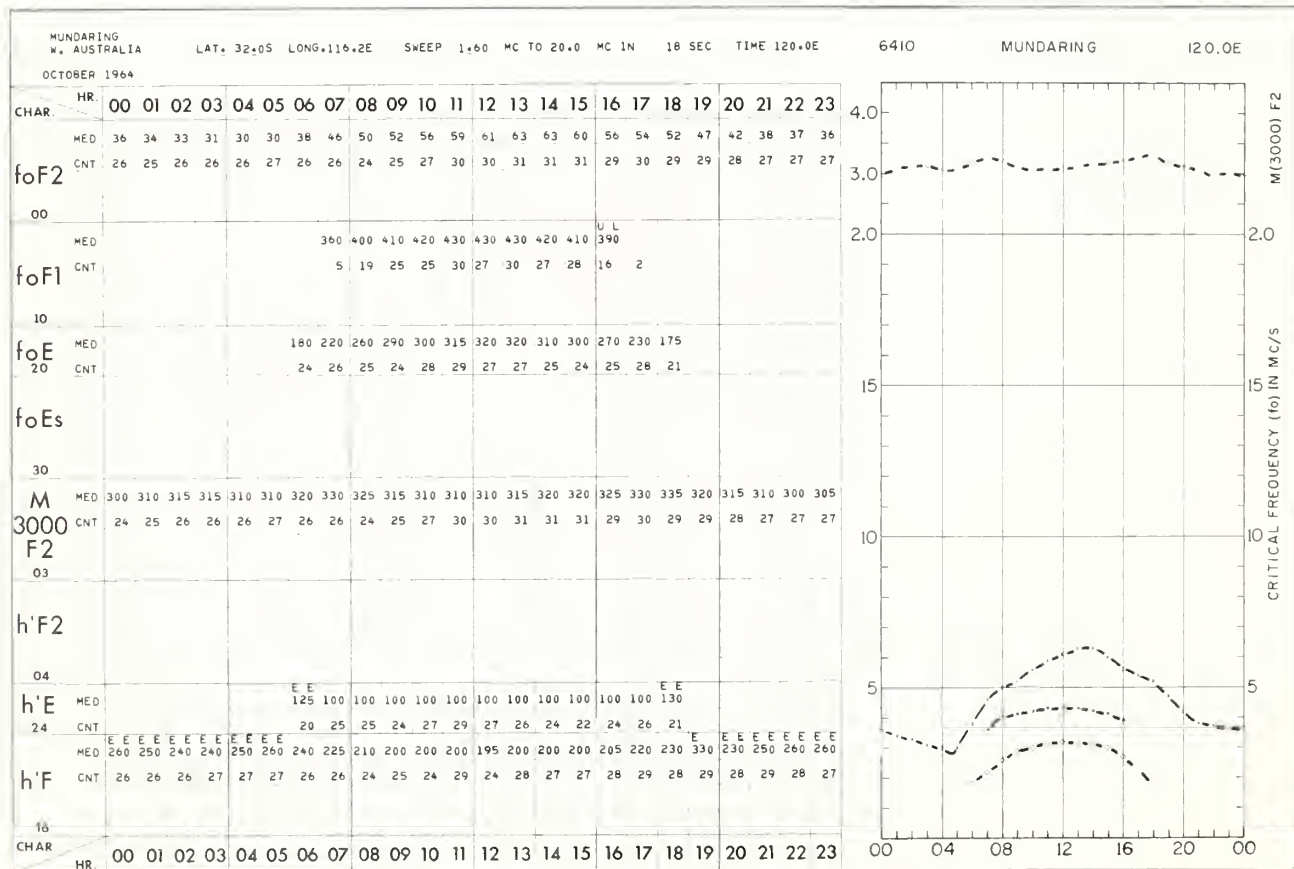
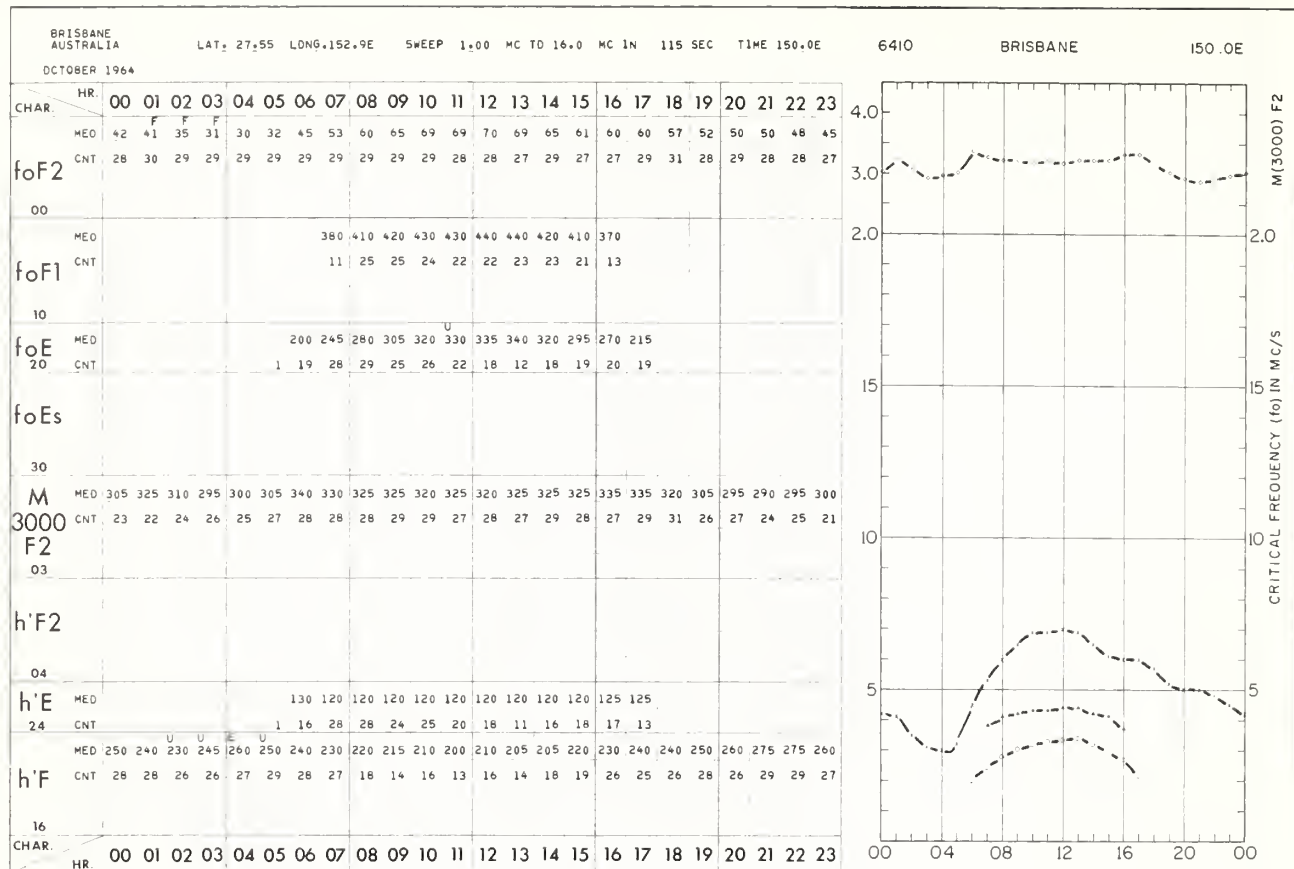


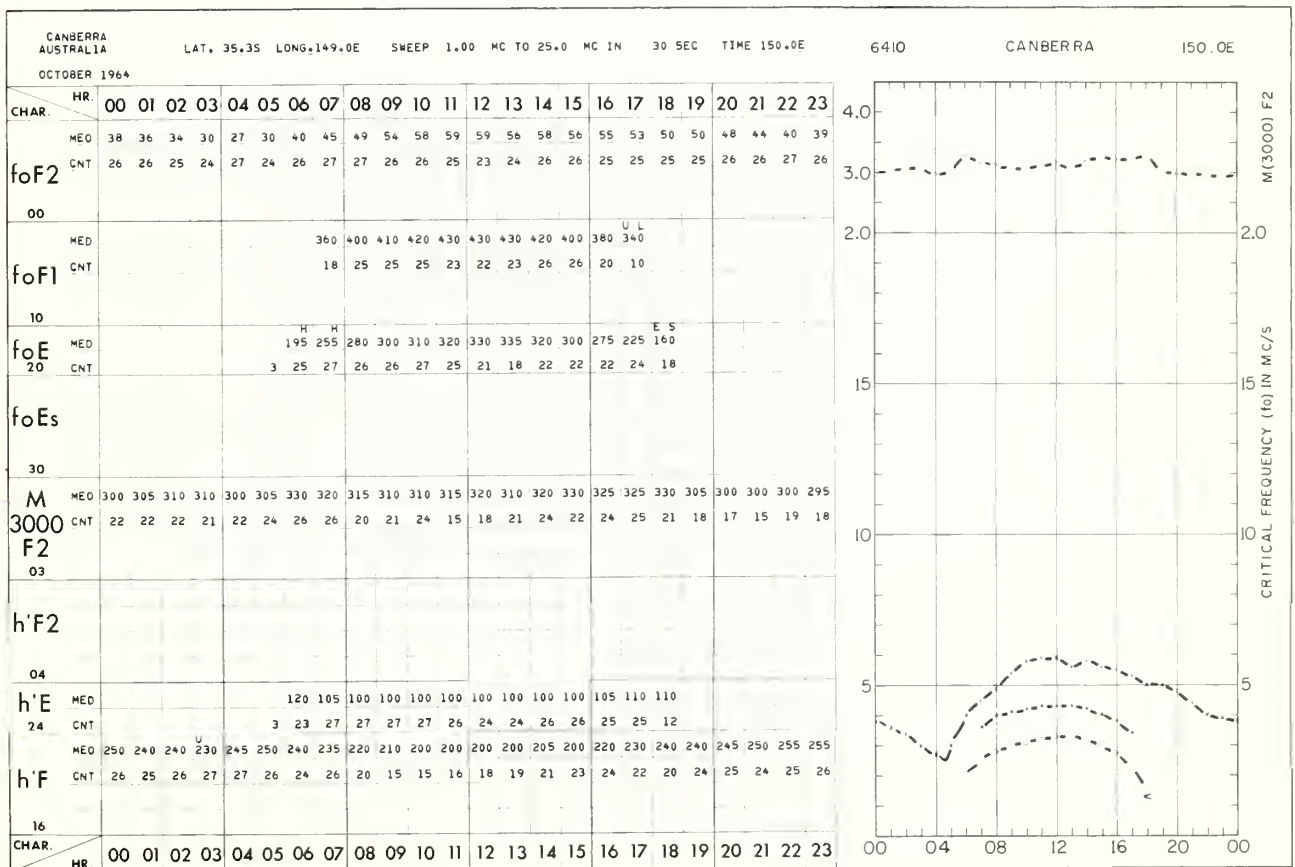
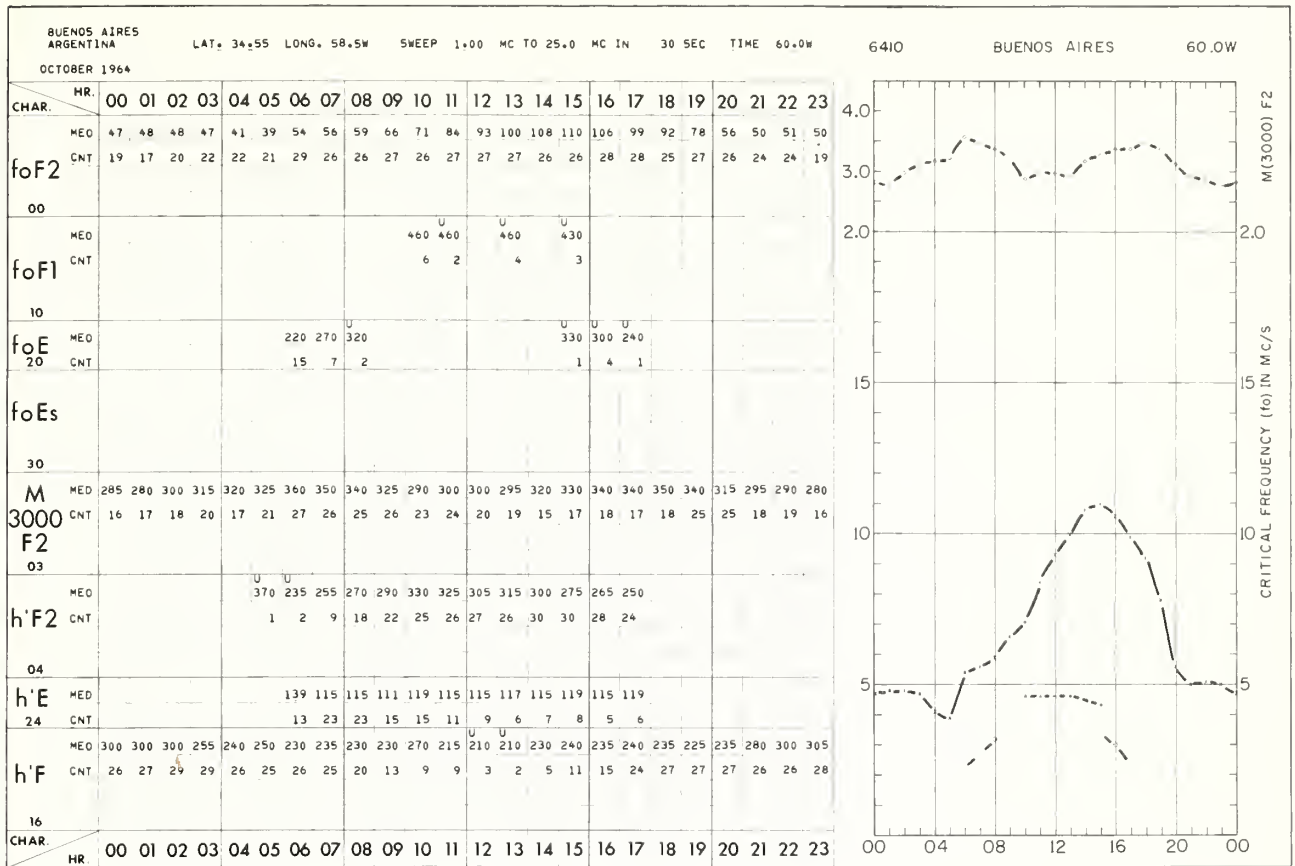


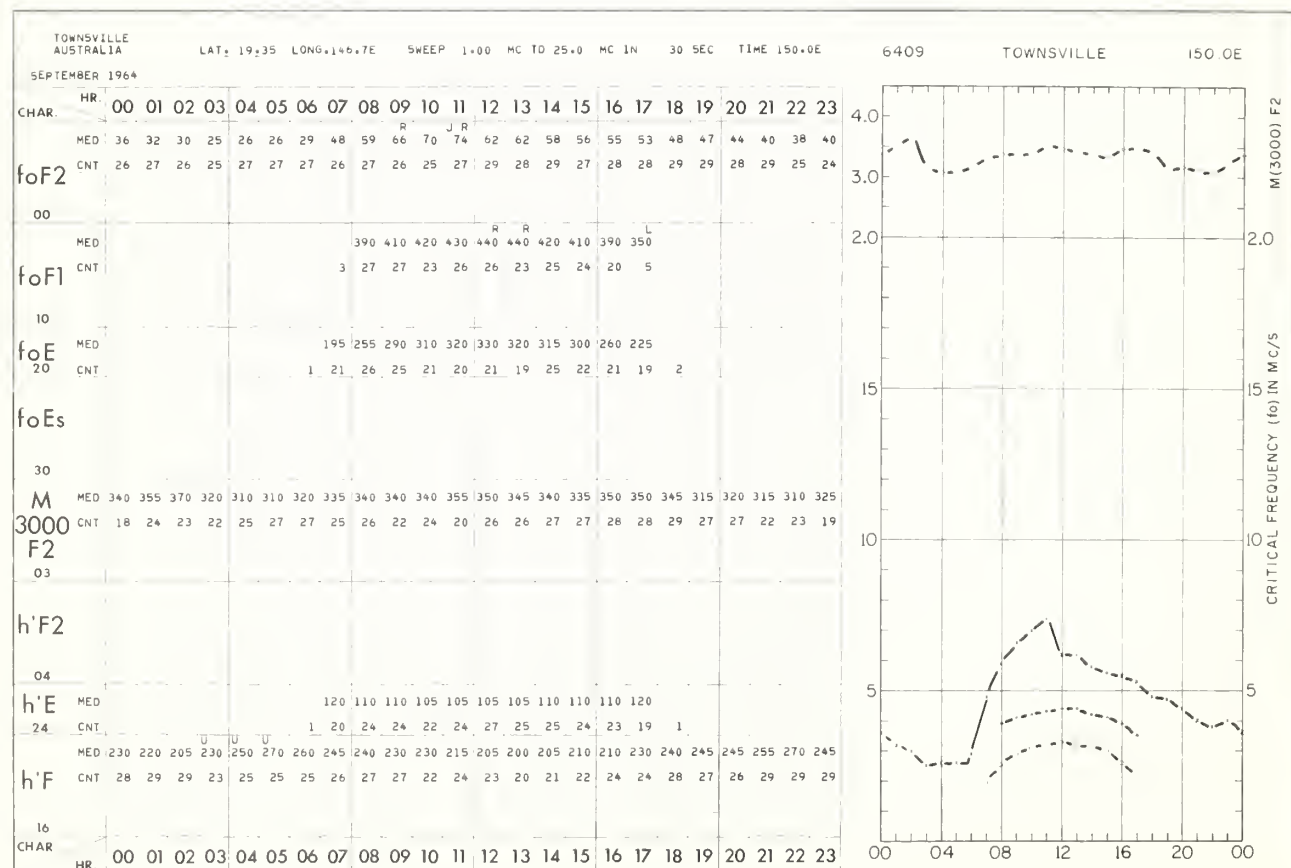
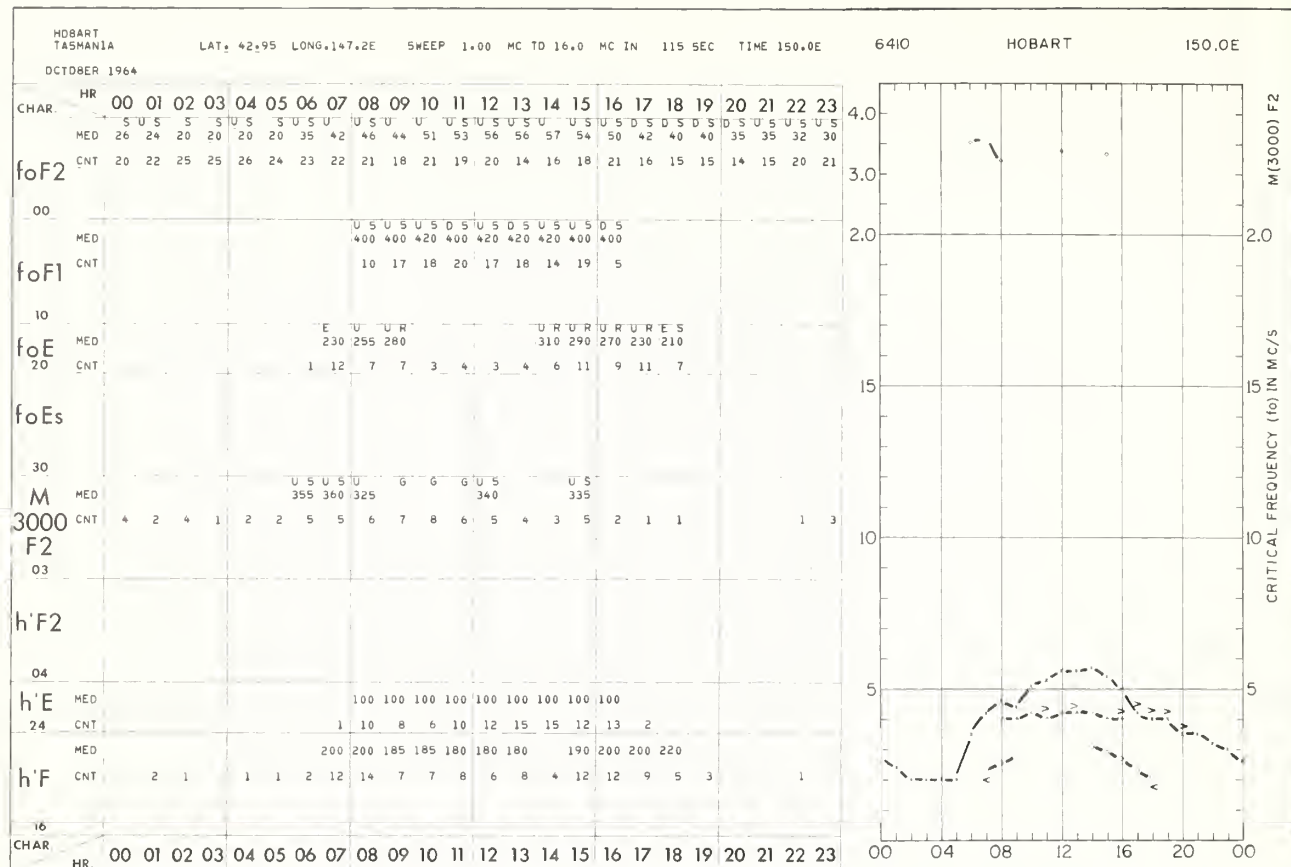


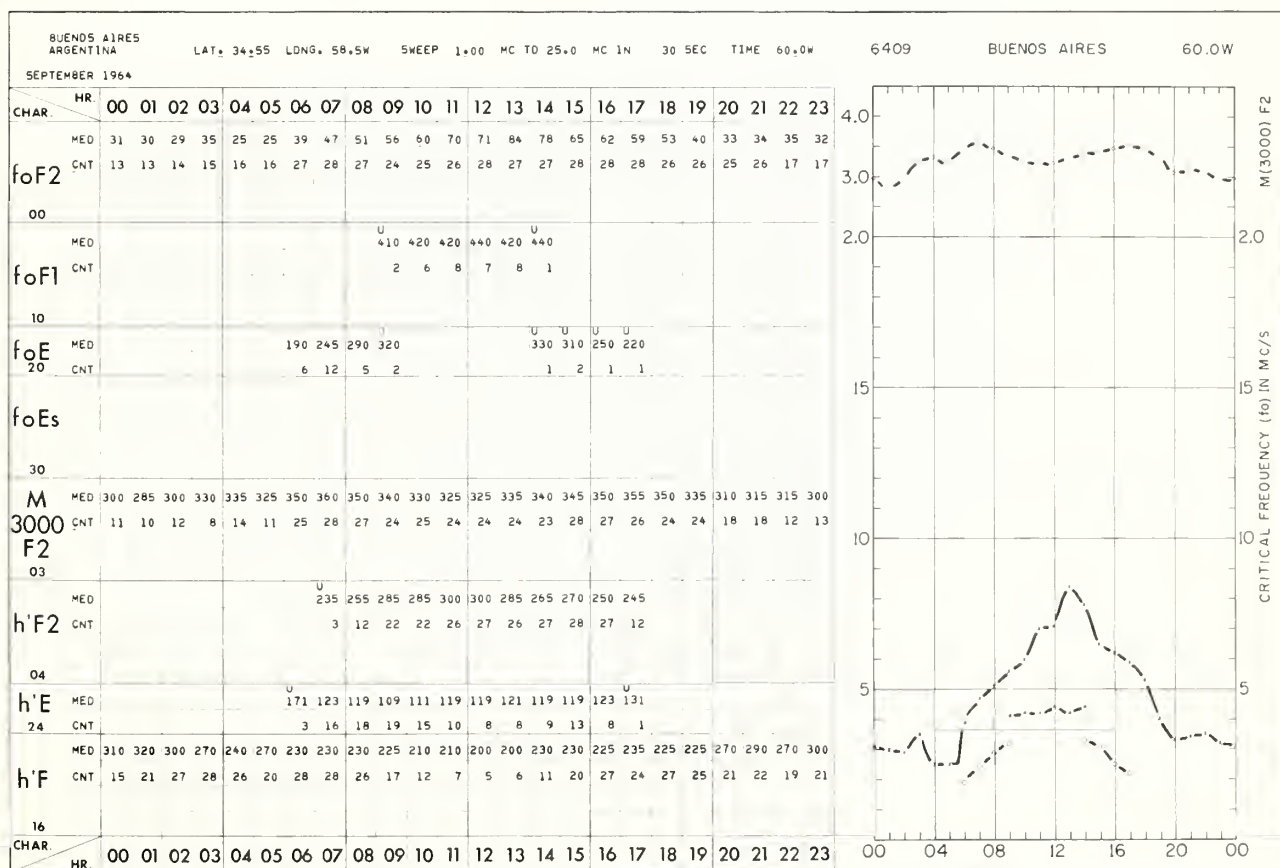
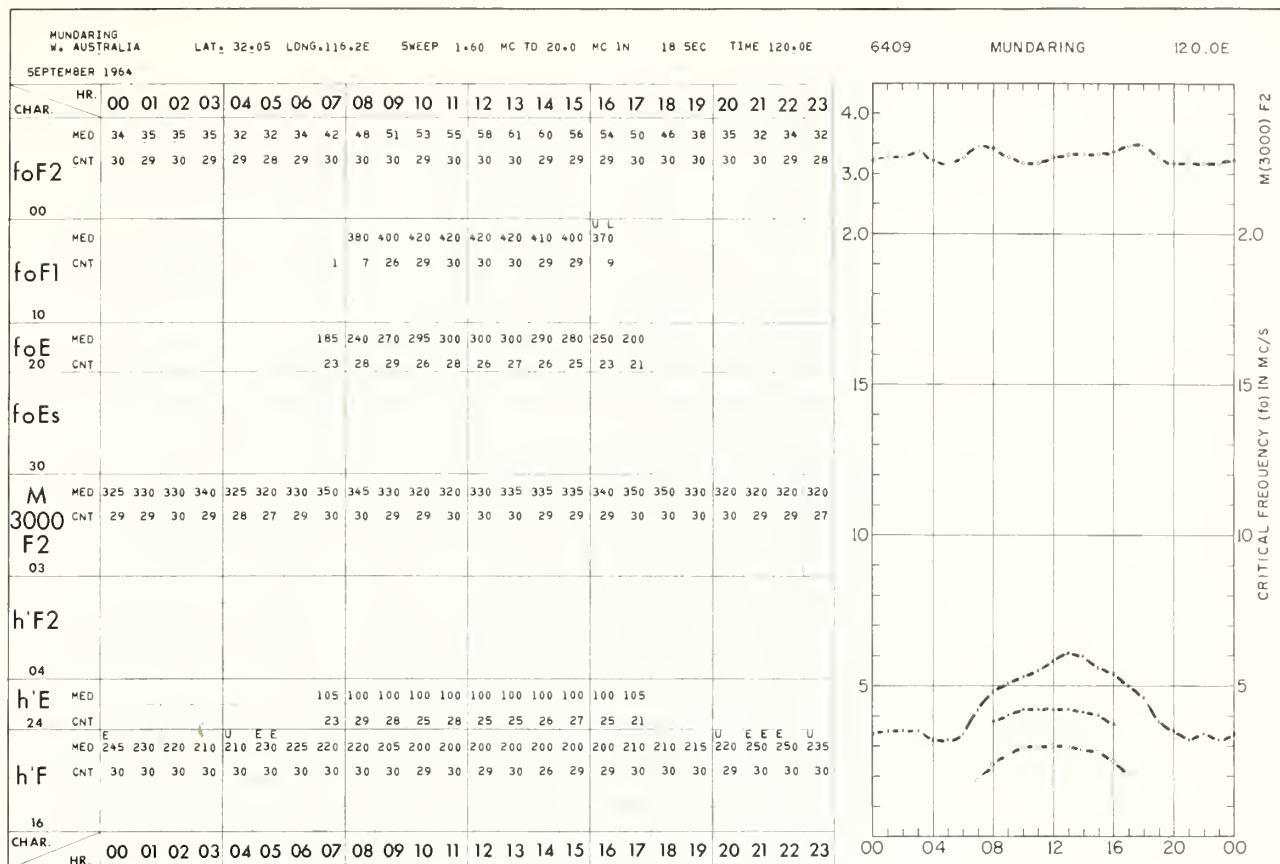


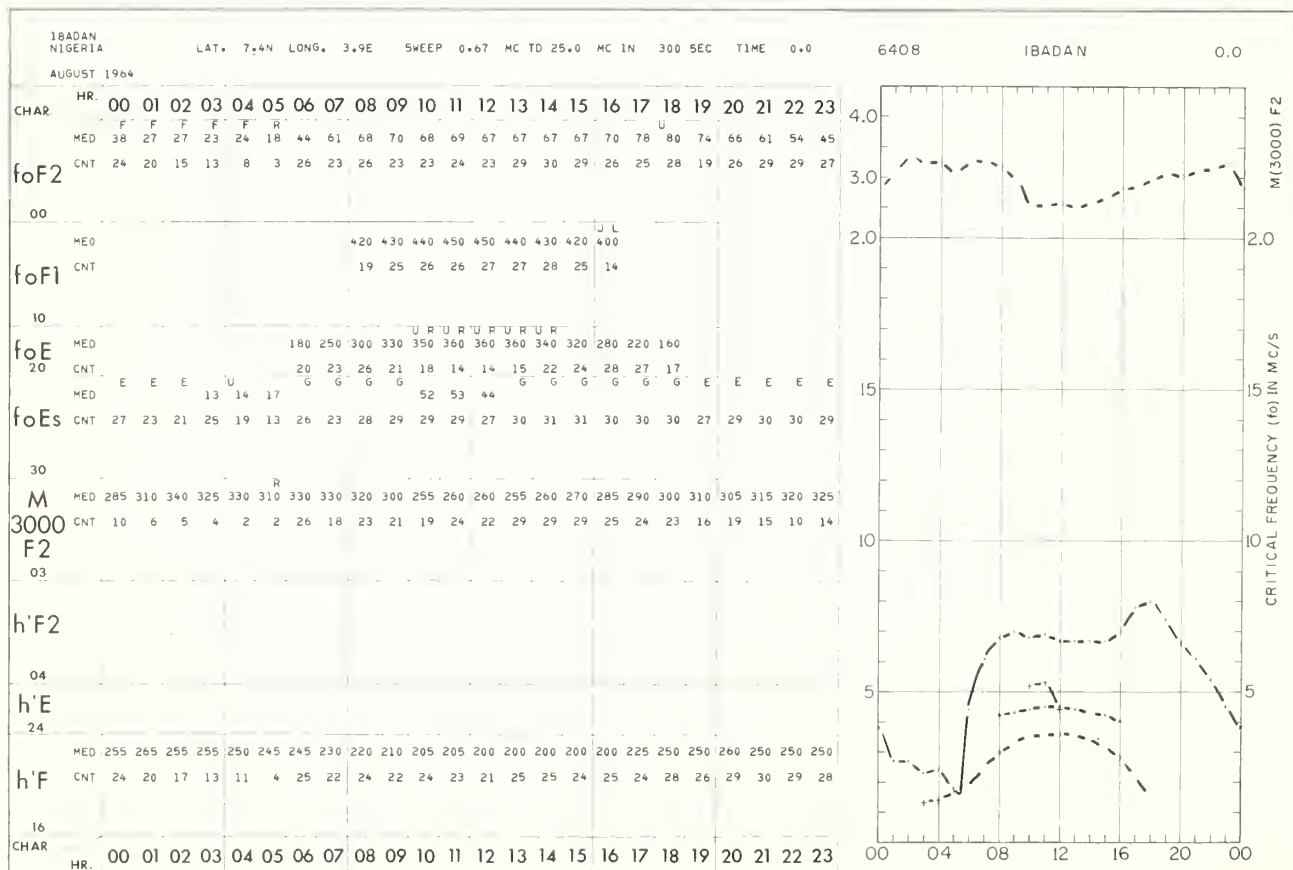
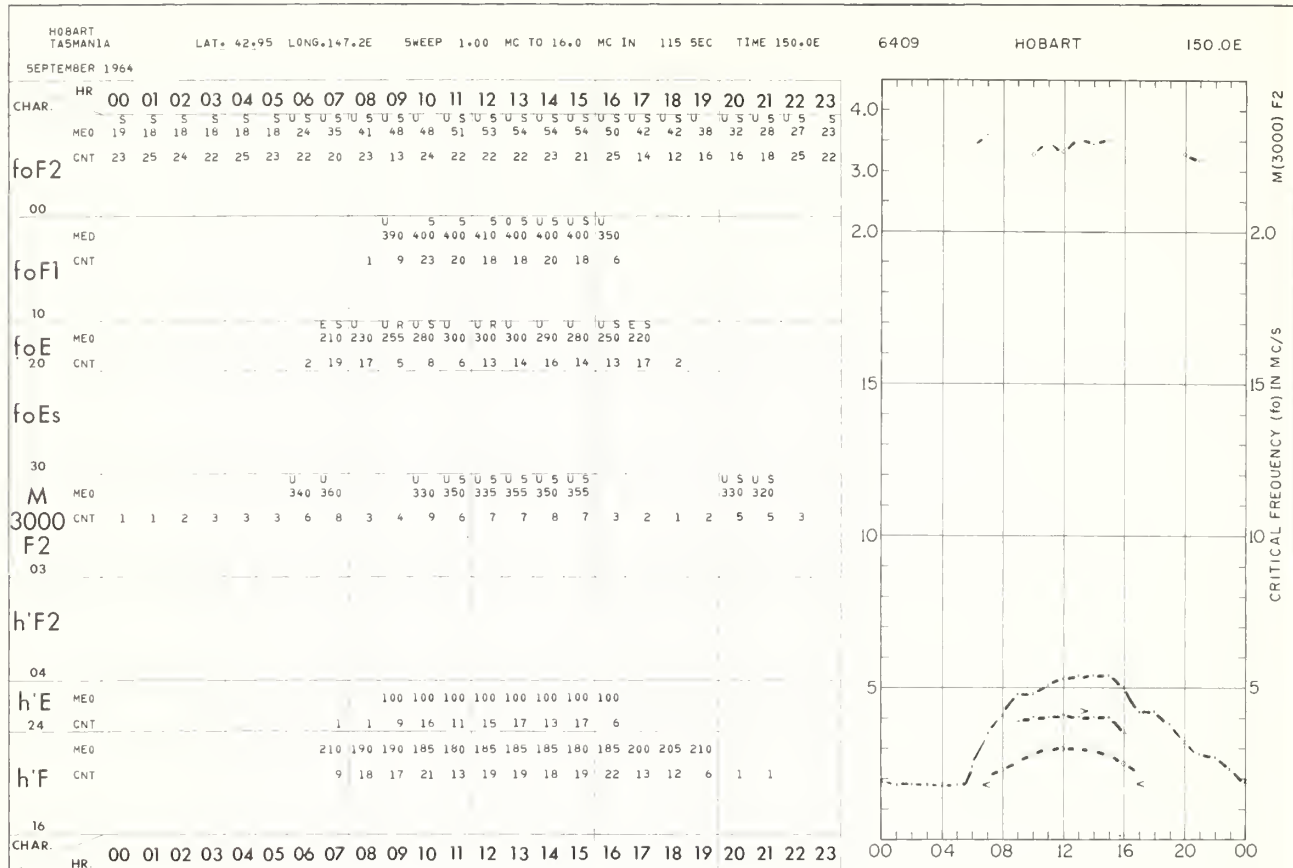


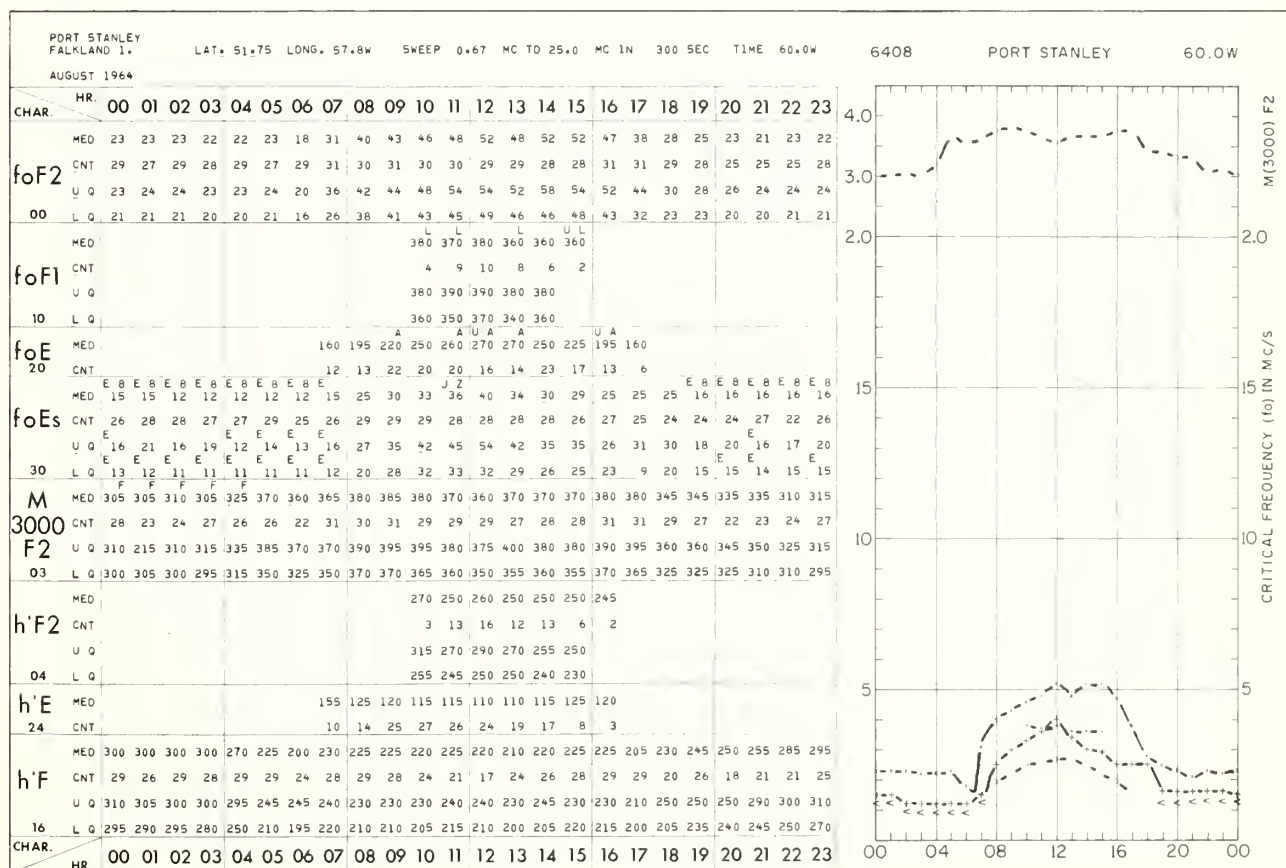
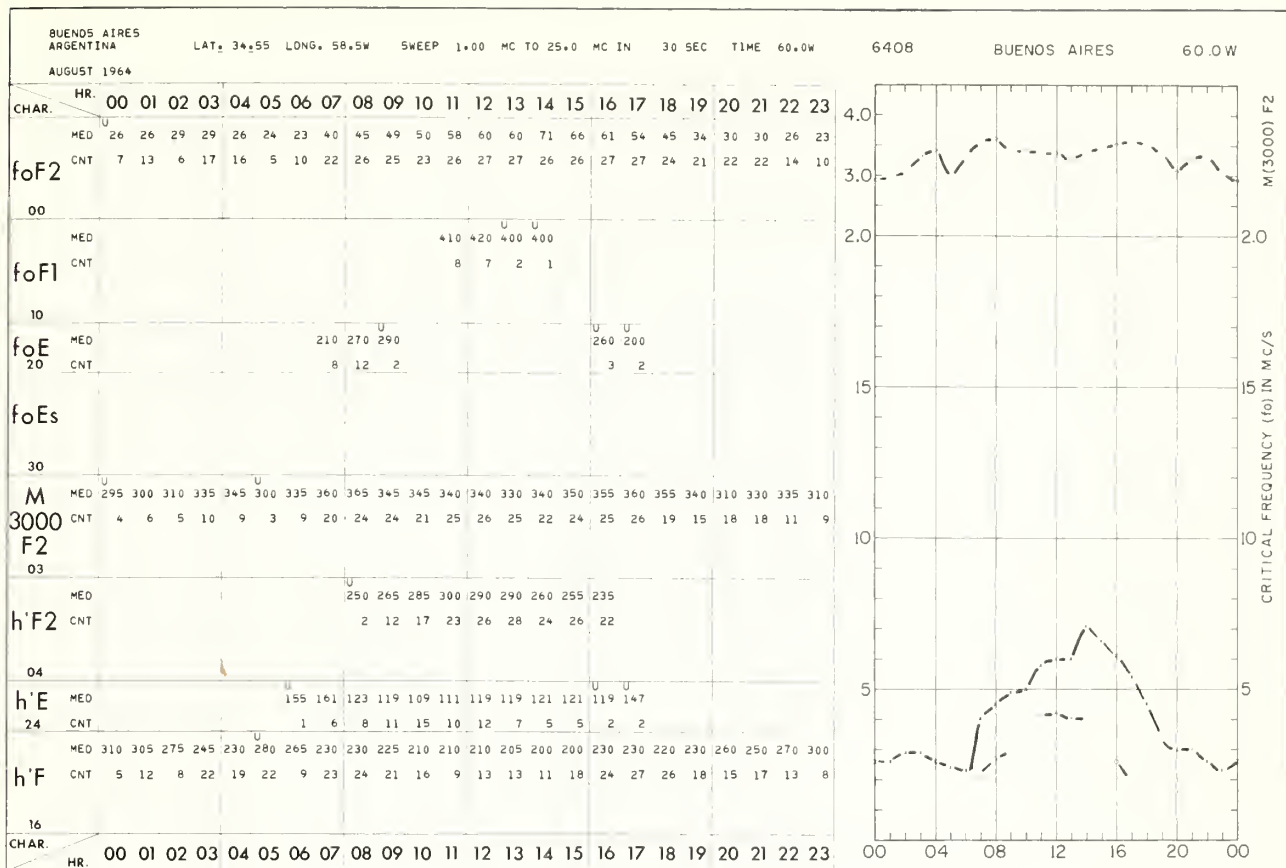


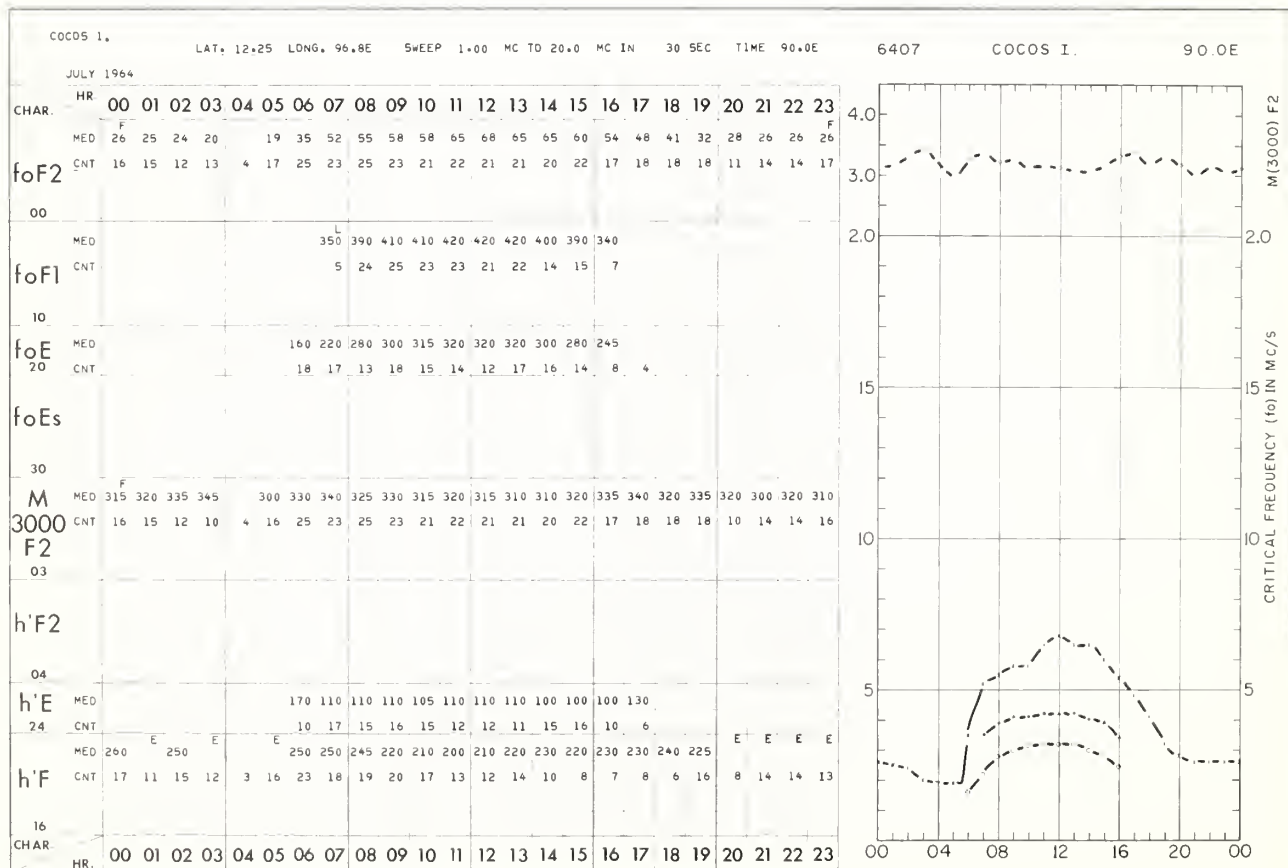
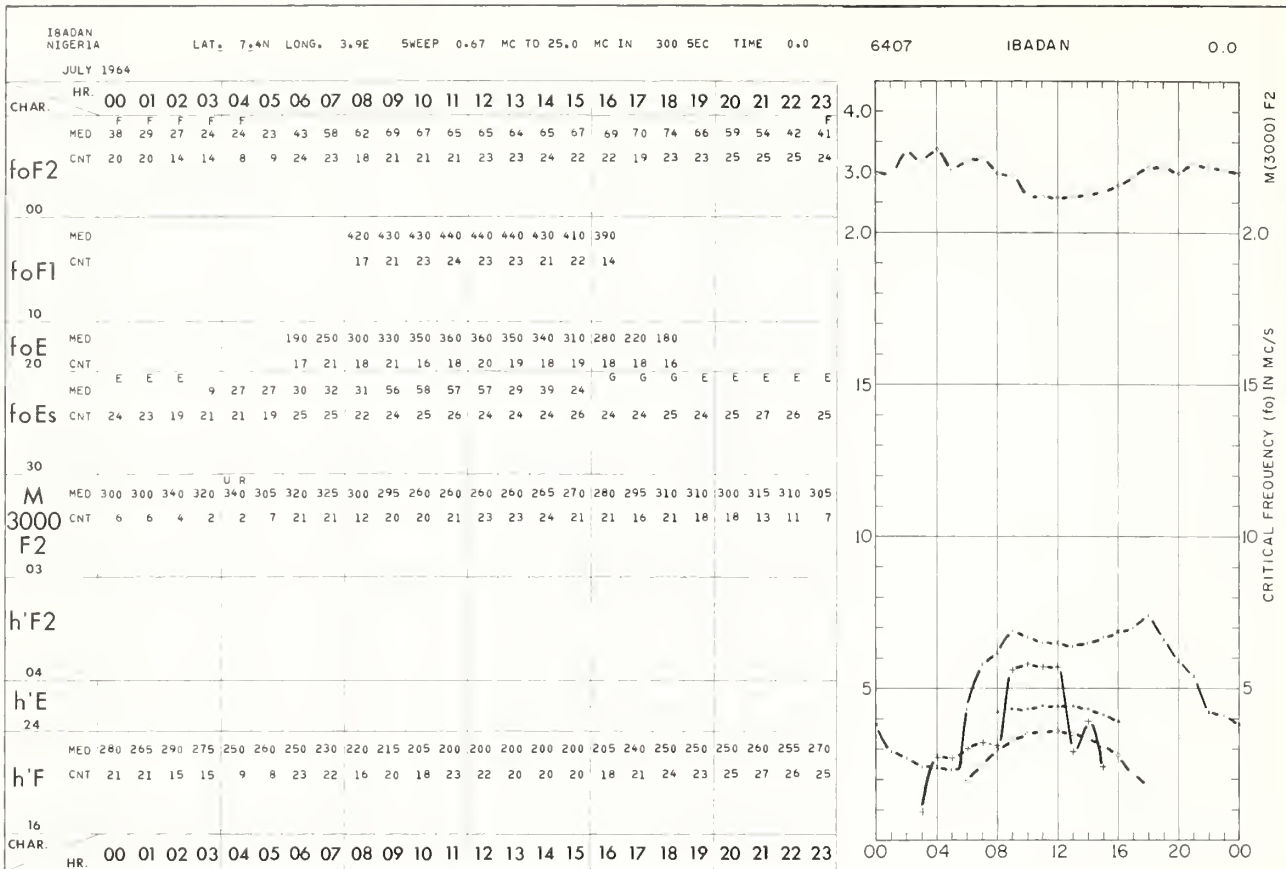


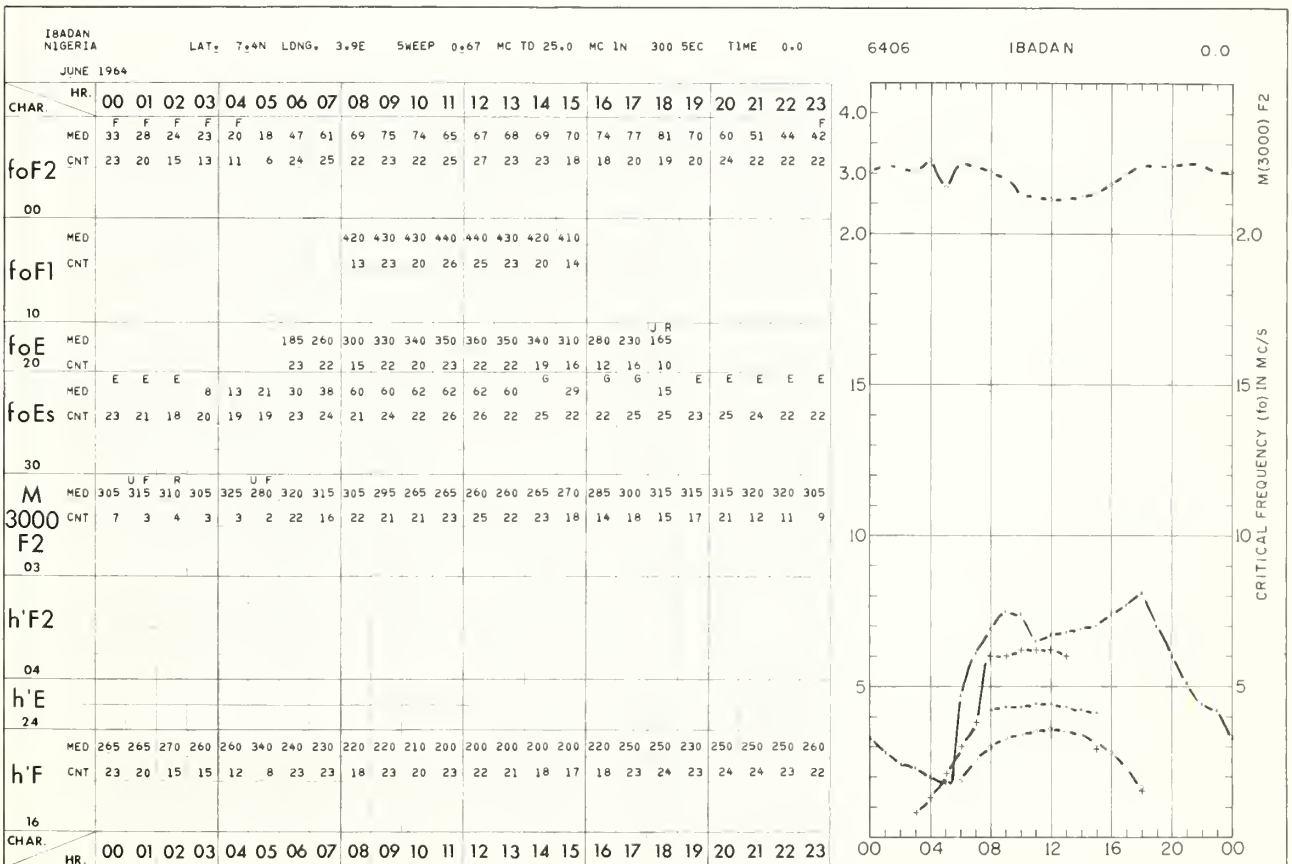
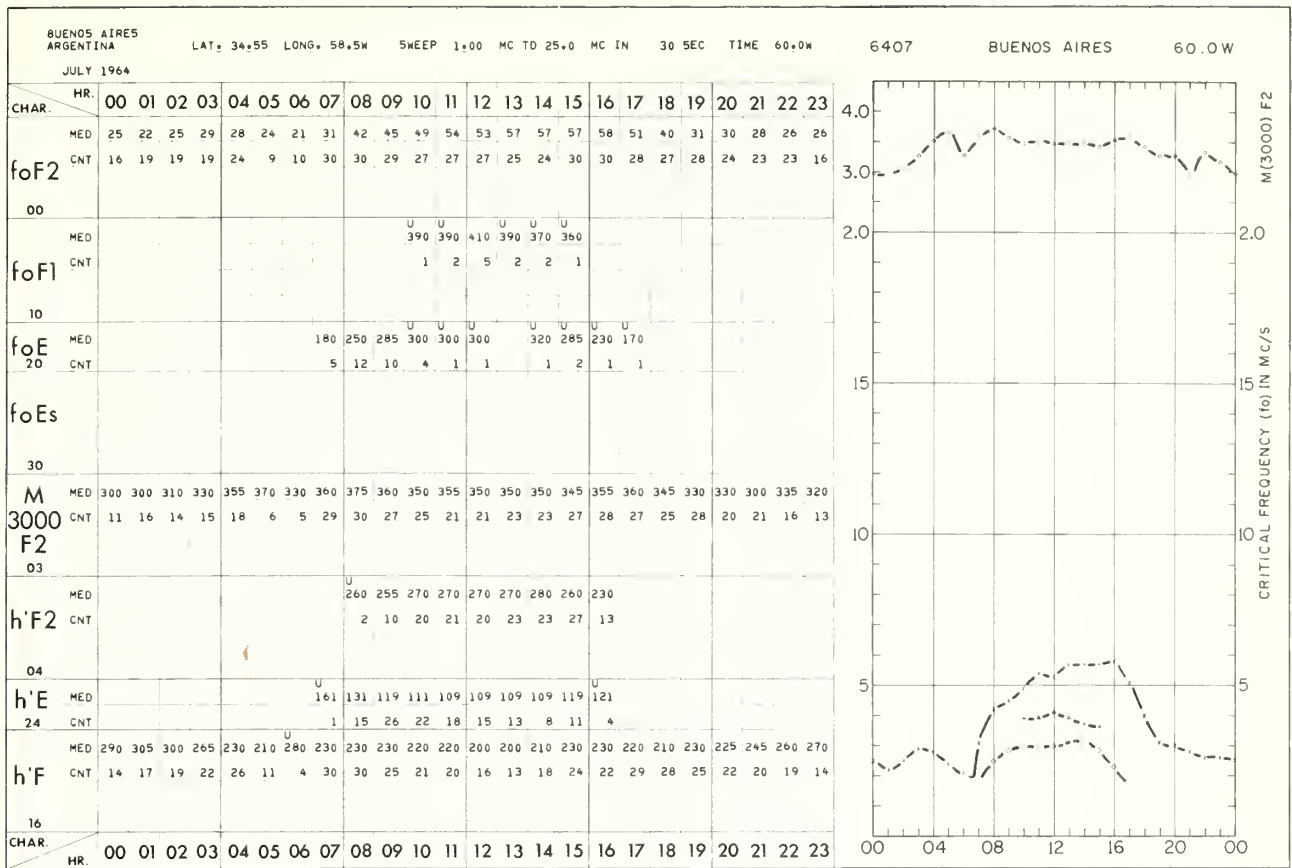


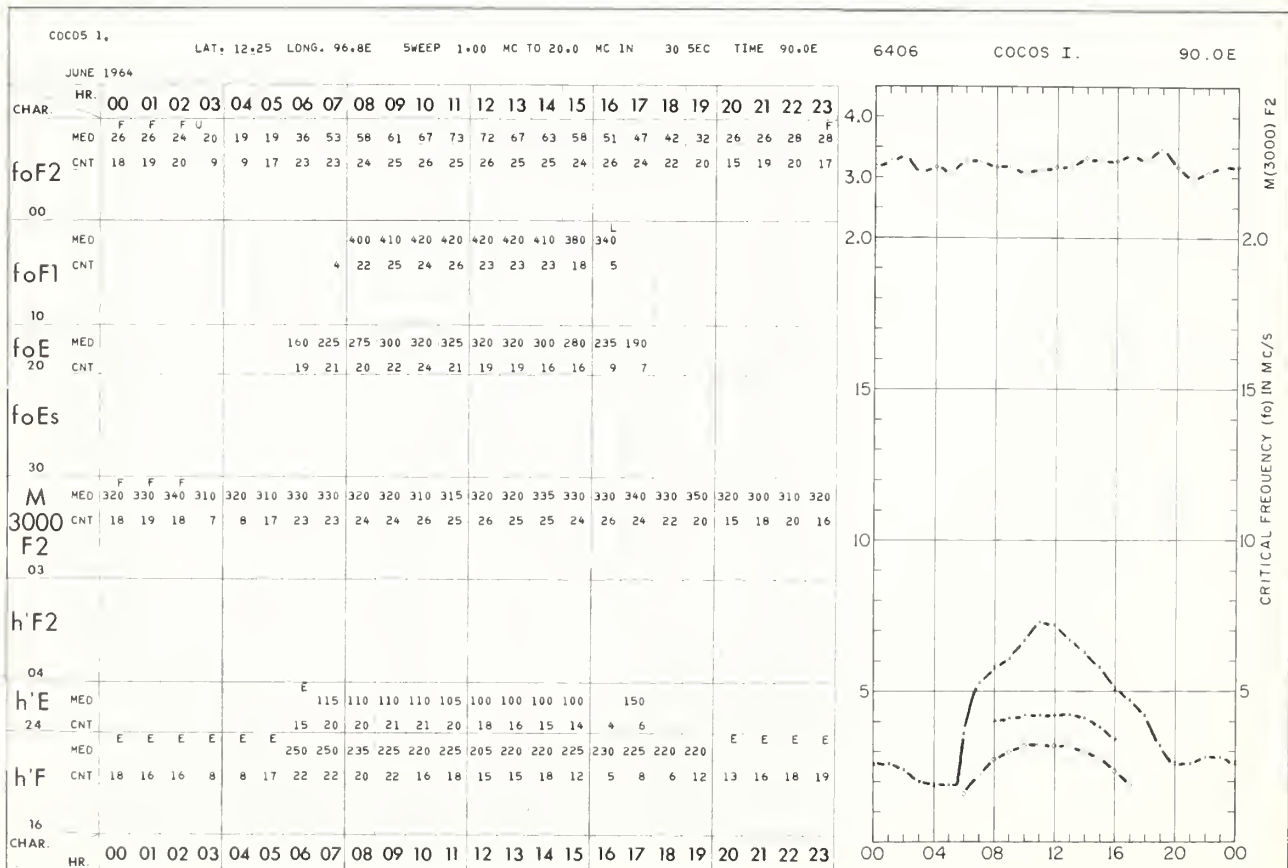
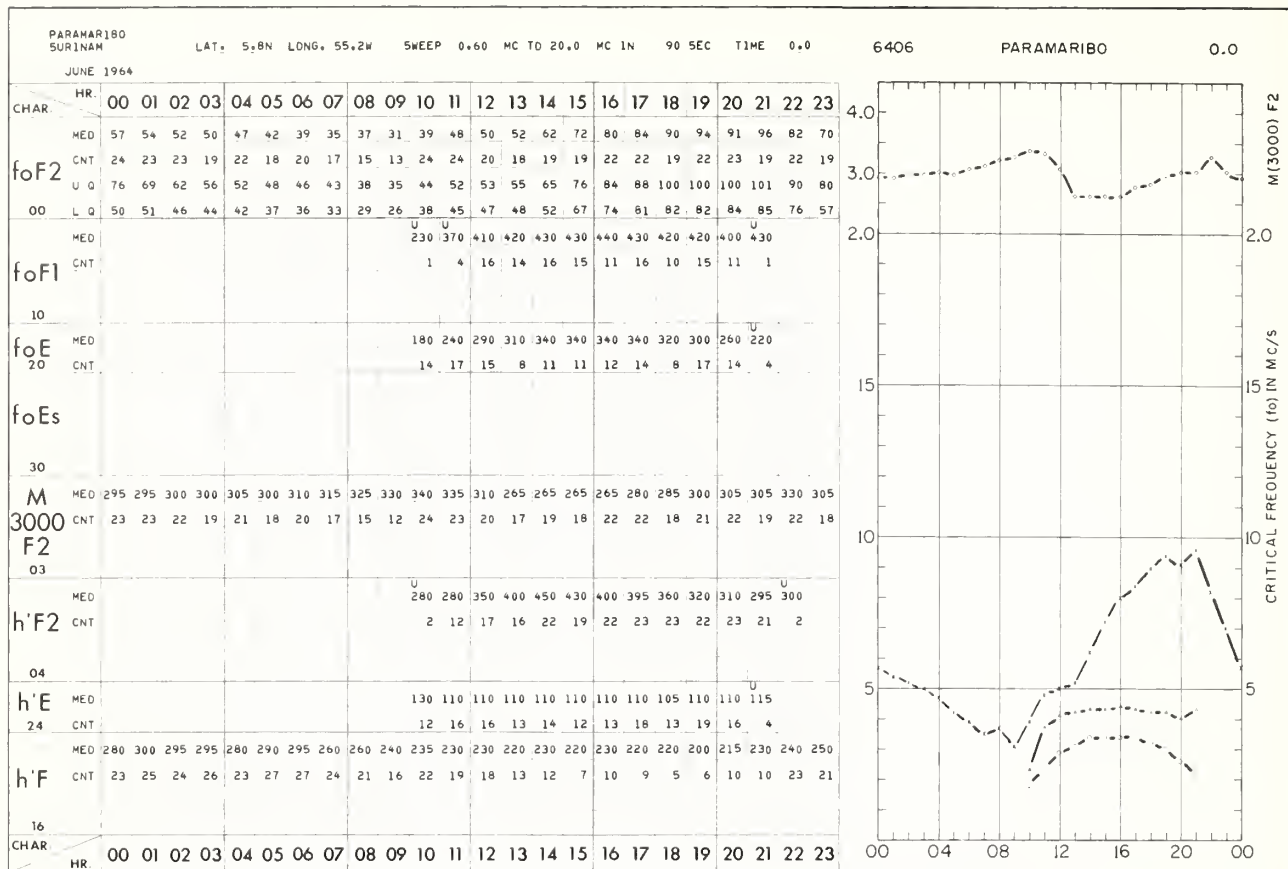


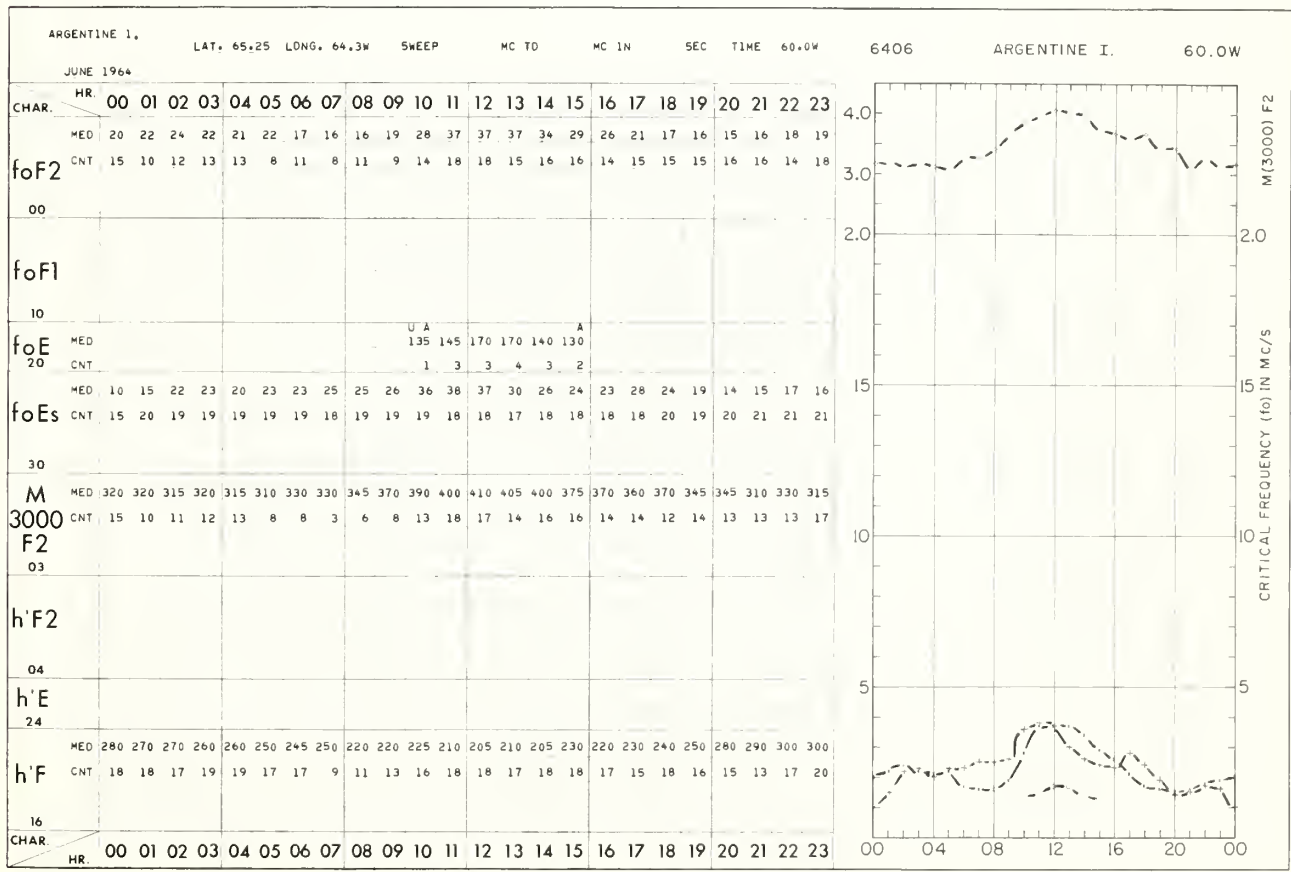
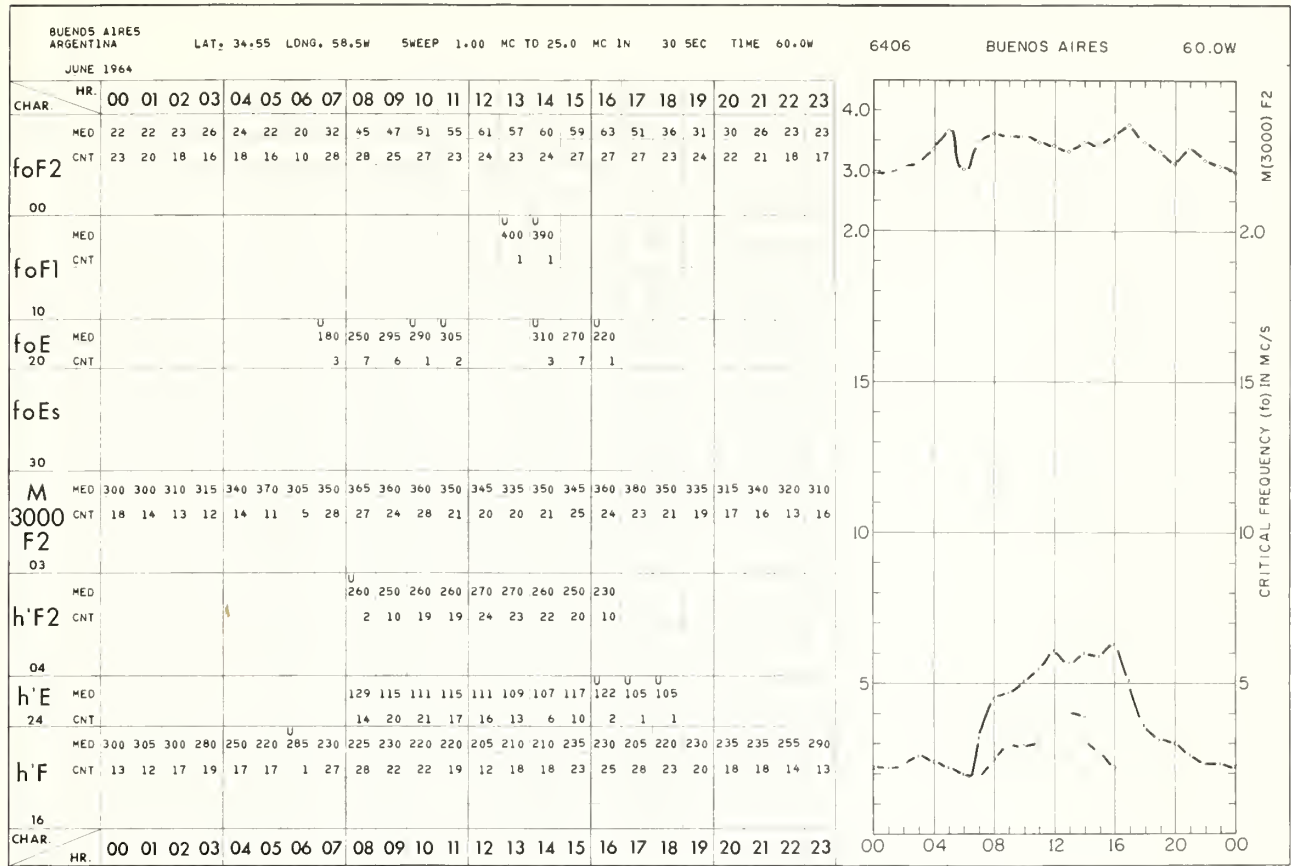


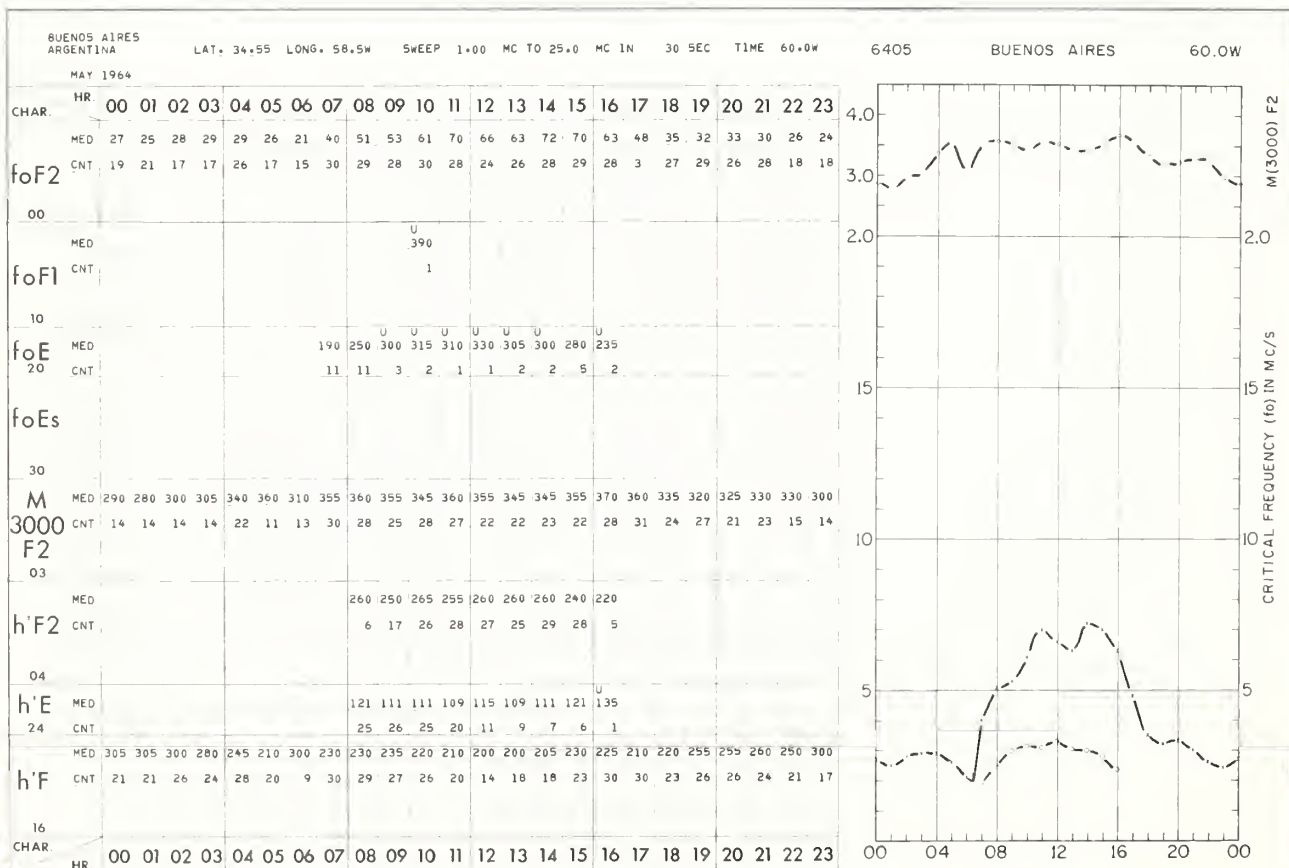
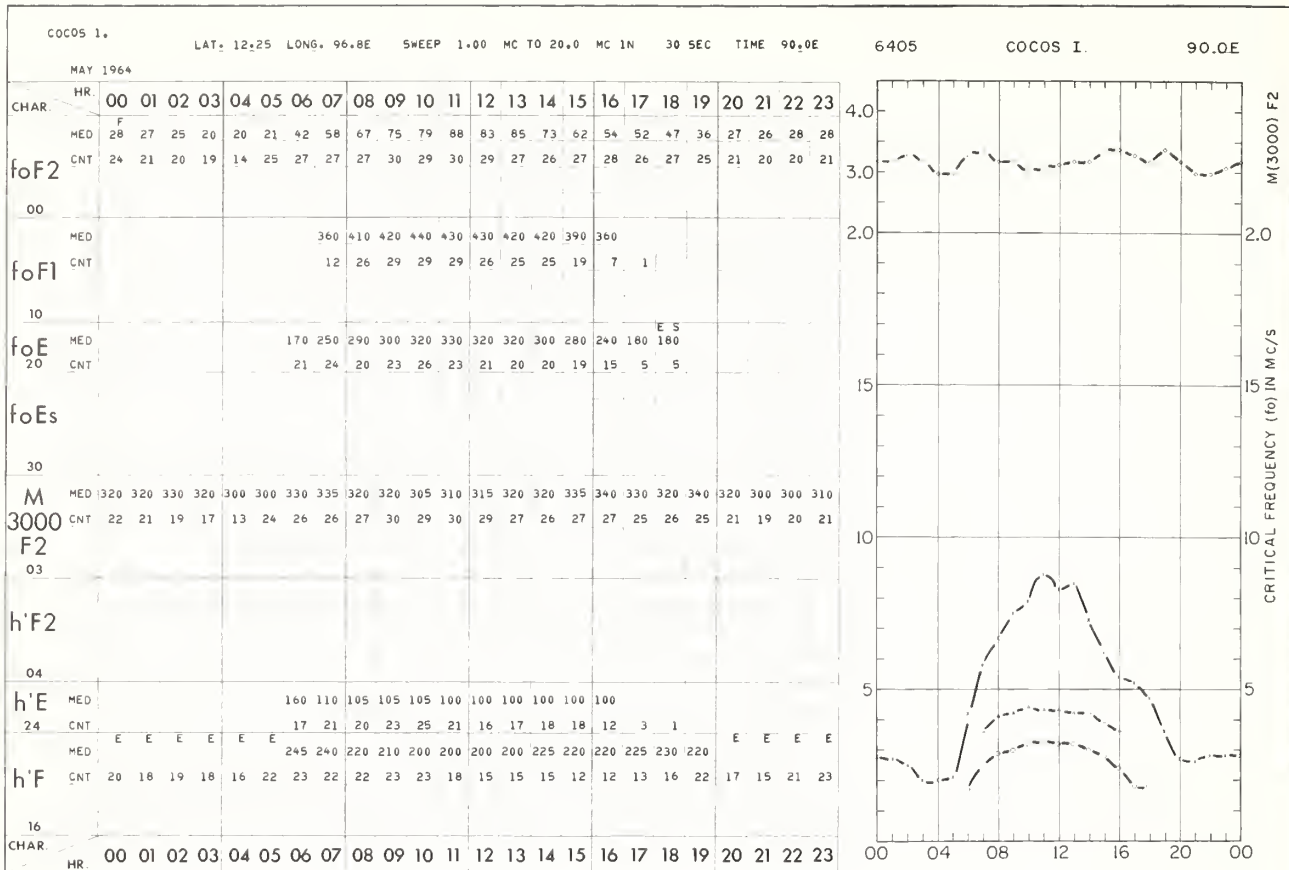


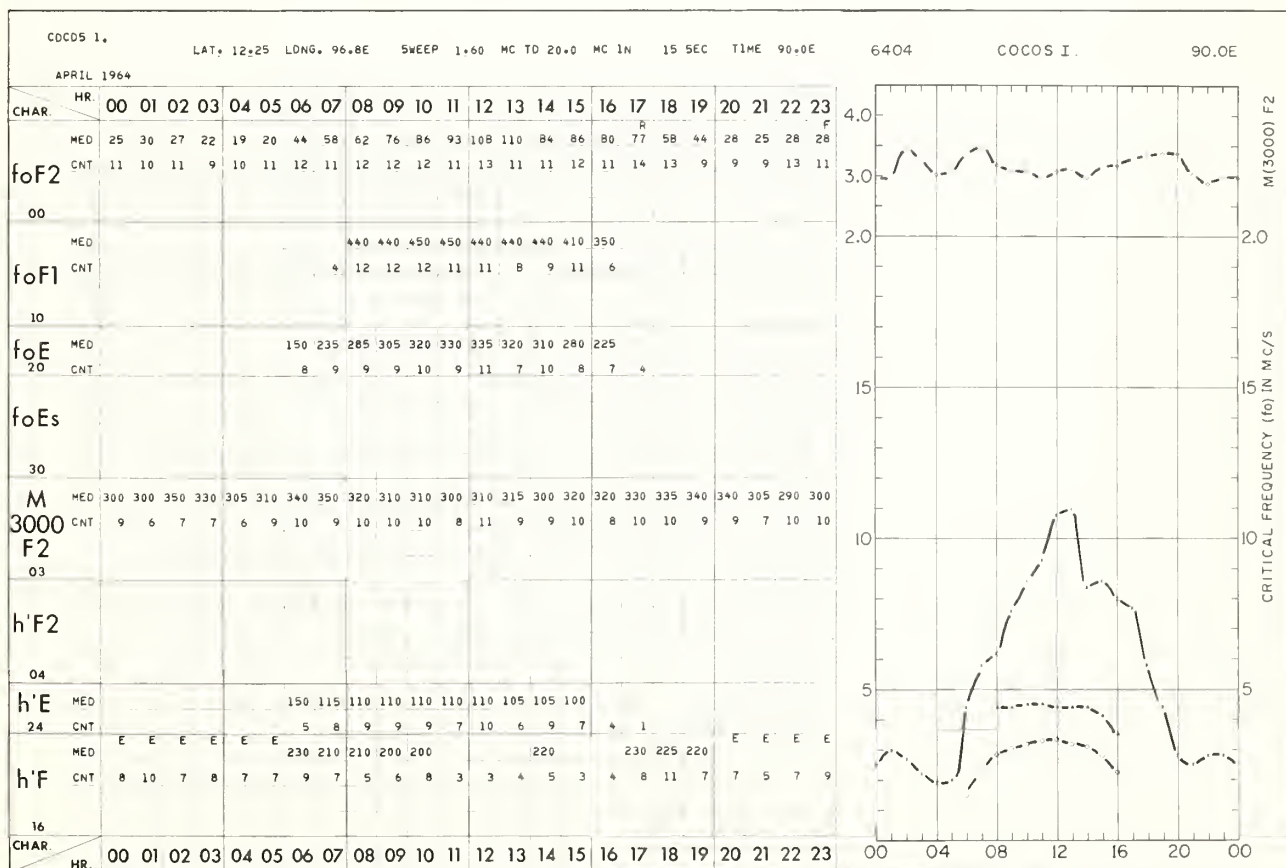
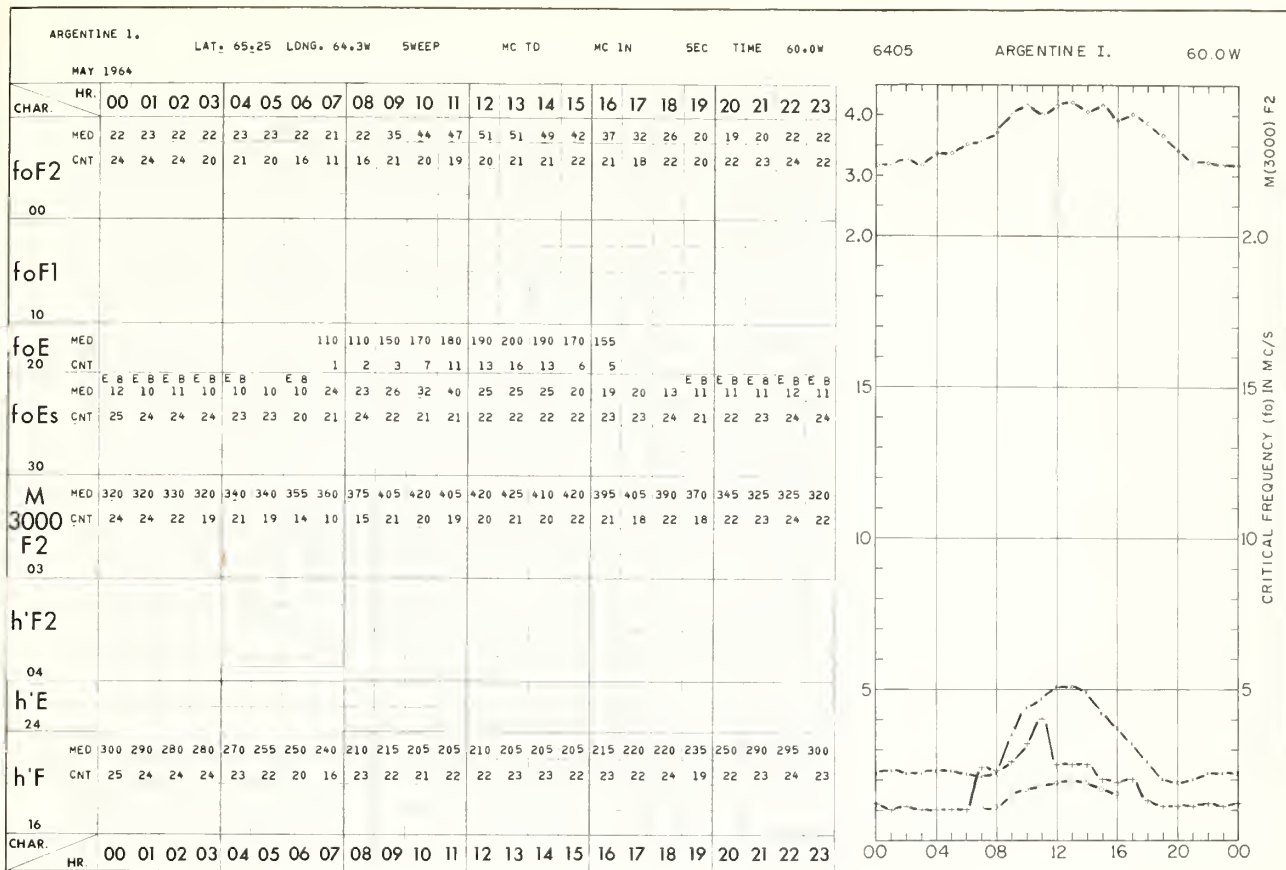


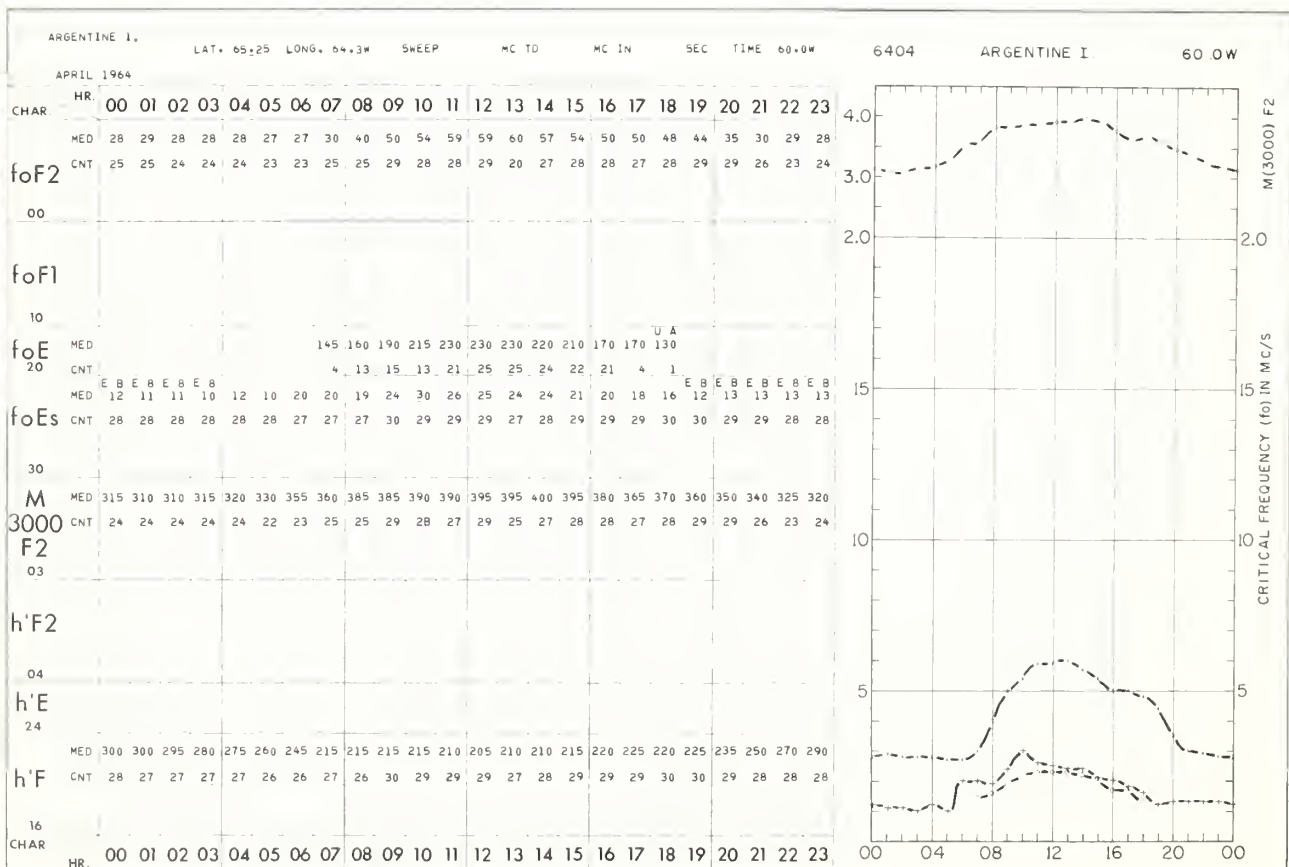
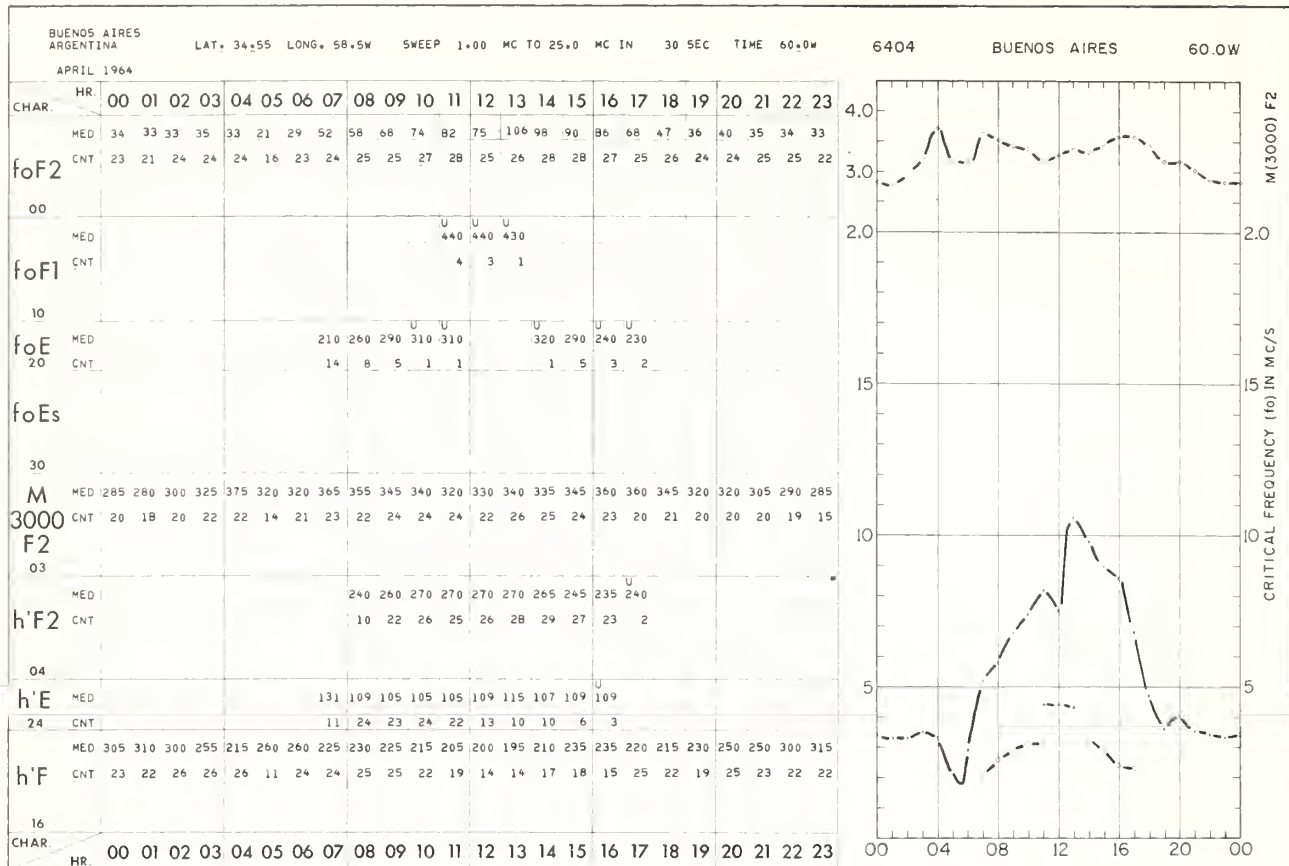


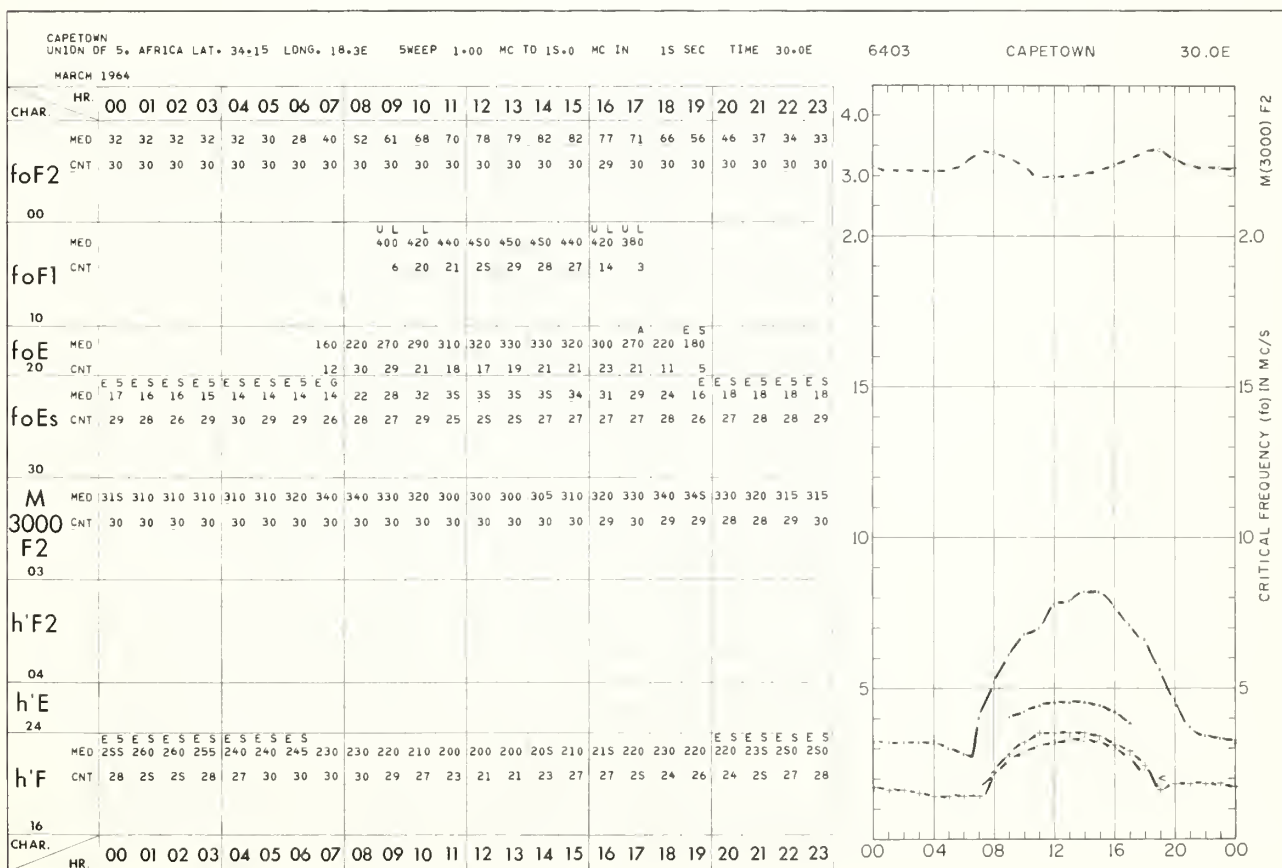
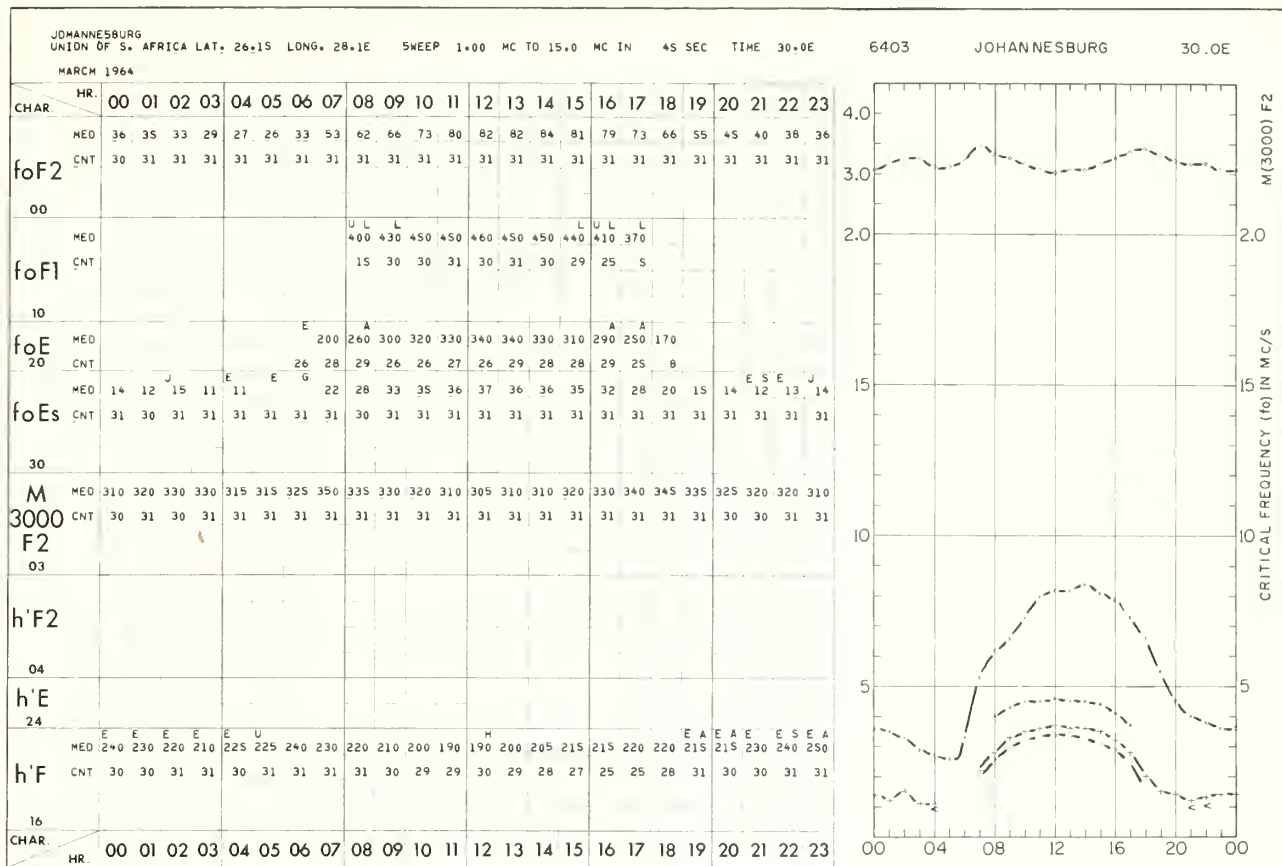


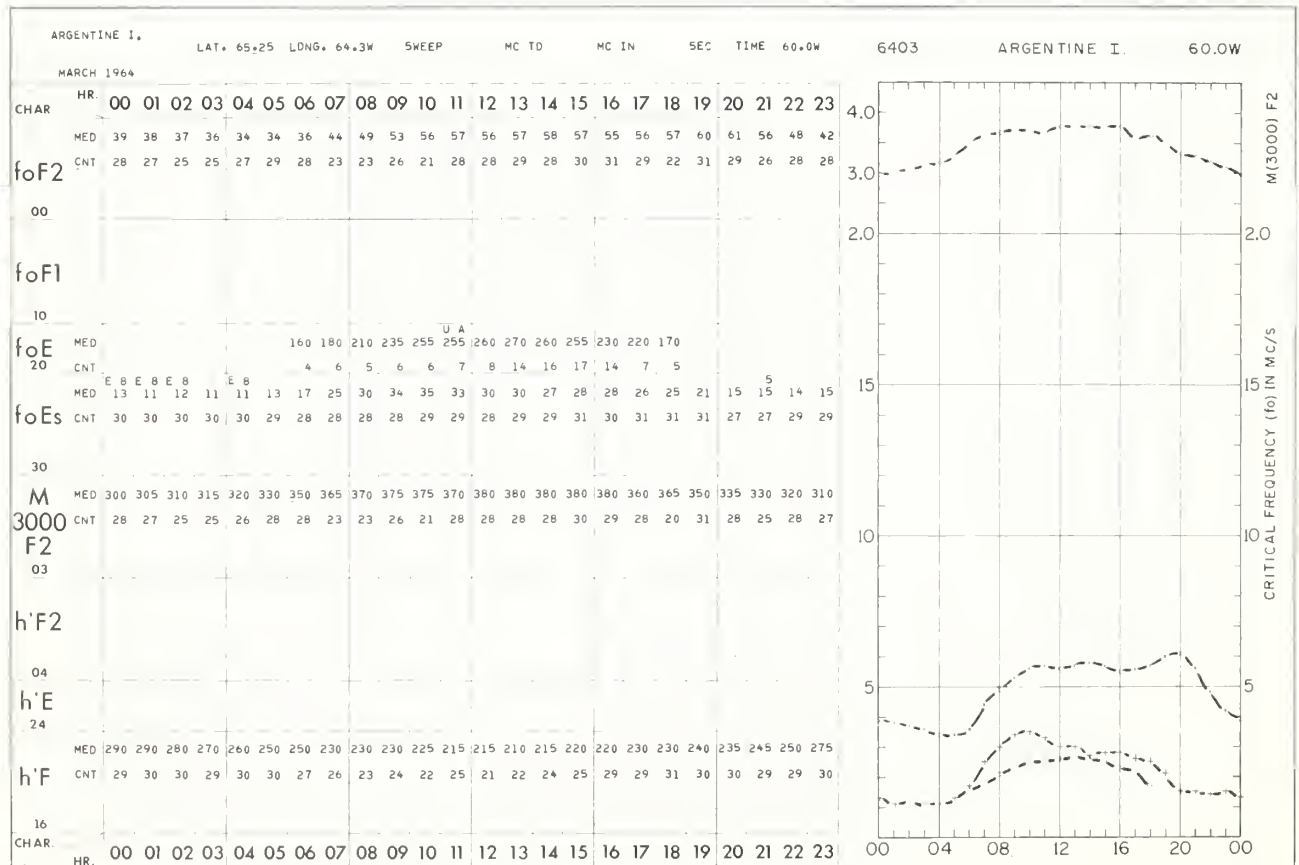
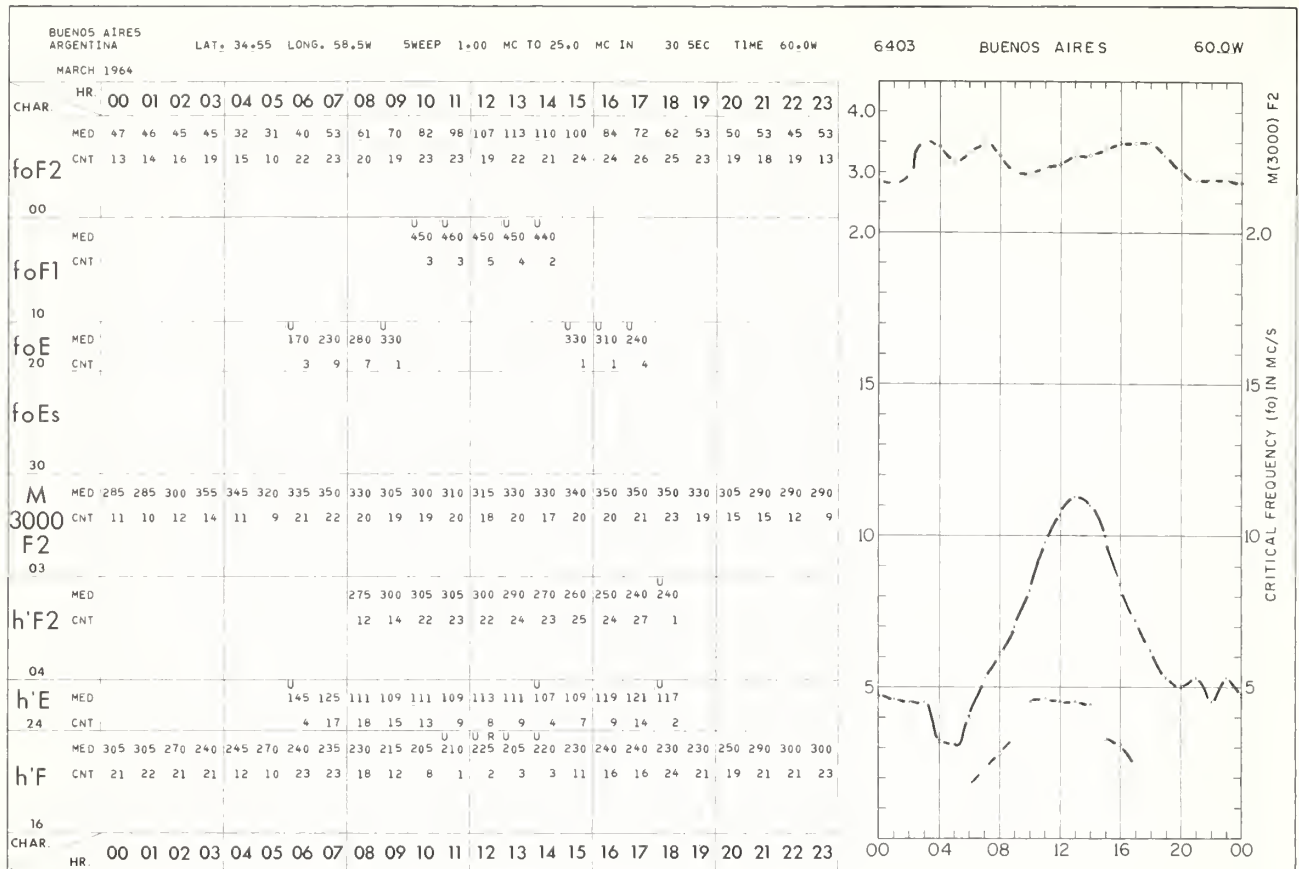












				PAGE
ADAK	ALASKA	1965	AUG.	7
		1965	SEPT.	3
AHMEDABAD	INDIA	1965	MAY	23
		1965	JUNE	21
AKITA	JAPAN	1965	JUNE	20
ANCHORAGE	ALASKA	1965	AUG.	6
		1965	SEPT.	2
ARGENTINE I.		1964	MAR.	50
		1964	APR.	48
		1964	MAY	47
		1964	JUNE	45
BOGOTA	COLOMBIA	1965	AUG.	9
BOULDER	COLORADO	1965	SEPT.	3
BRISBANE	AUSTRALIA	1964	OCT.	36
BUENOS AIRES	ARGENTINA	1964	MAR.	50
		1964	APR.	48
		1964	MAY	46
		1964	JUNE	45
		1964	JULY	43
		1964	AUG.	41
		1964	SEPT.	39
		1964	OCT.	37
		1964	NOV.	35
		1964	DEC.	33
		1965	JAN.	31
		1965	FEB.	29
		1965	MAR.	27
CANBERRA	AUSTRALIA	1964	OCT.	37
CAPETOWN	UNION OF S. AFRICA	1964	MAR.	49
CHURCHILL	CANADA	1965	JULY	14
COCOS I.		1964	APR.	47
		1964	MAY	46
		1964	JUNE	44
		1964	JULY	42
COLLEGE	ALASKA	1965	AUG.	5
		1965	SEPT.	1
CONCEPCION	CHILE	1965	AUG.	10
DOORBES	BELGIUM	1965	JULY	14
EL CERILLO	MEXICO	1965	AUG.	9
FT. BELVOIR	VIRGINIA	1965	SEPT.	4
GODLEY HEAD	NEW ZEALAND	1965	JULY	18
GRAND BAHAMA I.		1965	JULY	17
		1965	AUG.	7
HOBART	TASMANIA	1964	SEPT.	40
		1964	OCT.	38
HUANCAYO	PERU	1965	JULY	17
		1965	AUG.	10
IBADAN	NIGERIA	1964	JUNE	43
		1964	JULY	42
		1964	AUG.	40

				PAGE
JOHANNESBURG	UNION OF S. AFRICA	1964	MAR.	49
JULIUSRUH/RUGEN	GERMANY	1965	JAN.	30
		1965	FEB.	28
KENORA	CANADA	1965	JULY	15
KIRUNA	SWEDEN	1965	JULY	12
KODAIKANAL	INDIA	1965	FEB.	28
		1965	MAR.	26
		1965	APR.	25
KOKUBUNJI	JAPAN	1965	JUNE	20
LYCKSELE	SWEDEN	1965	JULY	12
MAUI	HAWAII	1965	AUG.	8
MUNDARING	W. AUSTRALIA	1964	SEPT.	39
		1964	OCT.	36
NARSSARSSUAQ	GREENLAND	1965	JULY	13
NURMIJARVI	FINLAND	1965	AUG.	6
		1965	SEPT.	2
OKINAWA I.		1965	AUG.	8
OTTAWA	CANADA	1965	JULY	16
PARAMARIBO	SURINAM	1964	JUNE	44
PARIS	FRANCE	1964	NOV.	34
		1964	DEC.	32
PORT STANLEY	FALKLAND I.	1964	AUG.	41
PRUHONICE	CZECHOSLOVAKIA	1965	MAR.	26
		1965	APR.	24
RAROTONGA	COOK I.	1964	OCT.	35
		1964	NOV.	34
		1964	DEC.	33
		1965	JAN.	31
		1965	FEB.	29
		1965	MAR.	27
		1965	APR.	25
RESOLUTE BAY	CANADA	1965	JULY	11
SLOUGH	ENGLAND	1964	DEC.	32
		1965	JAN.	30
SODANKYLA	FINLAND	1965	AUG.	5
		1965	SEPT.	1
ST. JOHNS	NEWFOUNDLAND	1965	JULY	15
TALARA	PERU	1965	MAY	23
THULE	GREENLAND	1965	JULY	11
		1965	AUG.	4
TORTOSA	SPAIN	1965	JUNE	19
		1965	JULY	16
TOWNSVILLE	AUSTRALIA	1964	SEPT.	38
TROMSO	NORWAY	1965	MAY	22
UPPSALA	SWEDEN	1965	JULY	13
WAKKANAI	JAPAN	1965	JUNE	19
WARSAW	POLAND	1965	APR.	24
		1965	MAY	22
		1965	JUNE	18
YAMAGAWA	JAPAN	1965	JUNE	21



